

IMPORTANT NOTICE



WHEREVER numbers are seen in parentheses---for example, on page 208, under Treatment for Lead Palsy will be seen (31), (32), 246)---these numbers refer to the Prescriptions to be used; said prescriptions begin on page 1100 and are numbered from 1 to 375.

For the convenience of the reader we have divided the indexes as follows:

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Pages 1431 to 1436

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Pages 1437 to 1440

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Pages 1441 to 1444

THE HOUSEHOLD PHYSICIAN

A TWENTIETH CENTURY MEDICAL

A PRACTICAL DESCRIPTION IN PLAIN LANGUAGE OF ALL
THE DISEASES OF MEN, WOMEN AND CHILDREN

WITH THE

LATEST DISCOVERIES IN MEDICINE AND MOST APPROVED METHODS OF
TREATMENT. BY A CORPS OF EMINENT SPECIALISTS,
PRACTISING PHYSICIANS AND SURGEONS

HERBERT E. BUFFUM, M.D.

Fellow of the Massachusetts Medical
Society.

IRA WARREN, A.M., M.D.

Fellow of the Massachusetts Medical
Society, etc.

WILLIAM THORNDIKE, M.D.

Fellow of the Massachusetts Medical
Society, and Member of Boston
Society for the Improvement
of Medicine, etc., and others.

A. T. LOVERING, M.D.

Member of the Faculty of Boston Uni-
versity School of Medicine.
Member Boston Homœopathic Medical
Society.

A. E. SMALL, A.M., M.D.

Ex-President of the Hahnemann Medi-
cal College, Chicago, Ill.

J. HEBER SMITH, M.D.

Professor of Materia Medica, Boston
University School of Medicine, and
late President of Massachusetts
Homœopathic Society.

Veterinary, CHARLES P. LYMAN, F.R.C.V.S.

President United States Veterinary Medical Association

Veterinarian-in-Chief to the Agricultural Department at Washington, D. C.

Member Massachusetts Veterinary Society,

Fellow of Royal College of Veterinary Surgeons, England,
Professor of Theory and Practice, and Dean of the School of Veterinary Medicine
in Harvard University.

Secretary of the Board of Cattle Commissioners of the Commonwealth of
Massachusetts.

FULLY ILLUSTRATED WITH MANIKINS, COLORED AND HALF-TONE PLATES

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ARE WITHOUT QUESTION THE BEST IN THE WORLD AND
REFERENCE TO WHICH IN TREATMENT OF SPECIAL
DISEASES WE ARE INDEBTED

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H. C. WOOD, A.M., M.D.
HERBERT A. HARE, M.D., B.S.C.

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PROF. ISODORE NEWMAN of Vienna.

DISEASES OF THE SKIN.

J. N. HYDE, A.M., M.D.
PROF. MORIZ KAPOSÍ of Vienna.

DISEASES OF THE EAR.

DR. ADAM POLITZER, Vienna.

MEDICINE.

WILLIAM OSLER, M.D., F.R.S., F.R.C.P.,
Baltimore, Md.
JAMES M. ANDERS, M.D., Ph.D.,
LL.D., Philadelphia, Pa.
H. R. ARNDT, M.D.,
Grand Rapids, Michigan.
WILLIAM BORRICKE, M.D.,
San Francisco, Cal.
J. M. DACOSTA, M.D., LL.D.,
Philadelphia, Pa.
DR. WILHELM V. LEUBE,
Wurzburg, Germany.
A. C. COWPERTHWAIT, M.D., Ph.D.,
LL.D., Chicago, Ill.
TIMOTHY F. ALLEN, A.M., M.D.,
New York.

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Chicago, Ill.
HORACE F. IVINS, M.D.,
Philadelphia, Pa.
D. BRADEN KYLE, M.D.,
Philadelphia, Pa.
E. B. DENCH, Ph.B., M.D.,
New York.

DISEASES OF THE SKIN.

W. ALLAN JAMIESON, M.D., F.R.C.P.,
Edinburgh, Scotland.

SURGERY.

F. S. DENNIS, A.M., M.D.
J. A. W. WHITE, M.D., Ph.D.
W. W. KEEN, M.D.

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Chicago, Ill.

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Chicago, Ill.

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London, Eng.

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NERVOUS DISEASES.

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Ph.D., Philadelphia, Pa.
W. R. GOWERS, M.D., F.R.C.P.,
F.R.S., London, England.
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DISEASES OF THE EYE.

L. WEBSTER FOX, A.M., M.D.,
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New York.
B. C. HIRST, M.D.,
Philadelphia, Pa.
G. W. VARMAN, M.D.,
New York.

PREFACE

TO THE

Household Physician.

THIS book is written for the people. It is based on the assumption that every man—the mechanic, the farmer, and the day laborer, as well as the professional and business man—has a right to all the knowledge he is capable of acquiring, on all subjects, medicine not excepted. The book aims, therefore, to popularize and adapt to the many what has been claimed as belonging only to the few.

We do not hesitate to avow that our sympathies are with the great masses, who may be called the bone and muscle of the race. They are, in the main, more shrewd, more endowed with common sense, more simple and true in their natural instincts, and consequently less perverted, than many of those who claim more refinement and a higher place in the social scale.

“All men,” says Hippocrates, one of the great fathers of medicine, “ought to be acquainted with the medical art. We believe that knowledge of medicine is the sister and companion of wisdom.” Such knowledge would shield the many from the impositions of quackery. No one who reads this book thoroughly will be often imposed upon thereafter by quack nostrums, or quack doctors. Every man’s physical organization is his own; and he is charged with the responsibility of taking care of it. To do this properly, he needs knowledge of it, and to withhold this from him is another form of the old oppression, which decreed knowledge and power to the few, and ignorance and obedience to the many.

In accordance with the design of the work, it has been written in plain, simple English, and brought within the comprehension of all who have medium powers of mind.

This book was prepared by a number of Medical Experts on different diseases; the work is not a compilation, but based on large practice and wide experience. In dealing with each disease we have aimed to sketch a brief pen-and-ink portrait, so like it that every reader shall know the original whenever he sees it; we then give, in the fewest words, the best treatment.

No work of the sort has ever explained the reasons or given the whys and wherefores of medicine anything like the extent of this book, thousands of which are on their mission of instruction, and carrying comfort and relief to as many homes throughout the land.

No pecuniary effort has been spared to include every known discovery of medicine and nursing to make this book absolute perfection, and to those who make of it a careful and intelligent study, it will prove to them in value "its weight in gold."

The book is extravagantly illustrated with engravings done expressly for this work; the colored lithographs and manikins were drawn under the supervision of expert surgeons, and add much to its value.

WOODRUFF PUBLISHING COMPANY.

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GENERAL INTRODUCTORY REMARKS.

Progress of Medicine.

MEDICINE may be divided into a science and an art. It is a science as it presents facts and evolves principles; an art as it consists of rules for practice. For its present attainments it is indebted partly to researches scientifically conducted, and partly to empirical discovery.

As a science, medicine is chiefly indebted, and must ever be, to the members of what is called the "regular profession." This body of men embraces a large number who are alike ornaments of the race, and lights of their profession. It is to the writings of this class that every student must go who would qualify himself for the proper discharge of the duties of a physician; and he who attempts the practice of medicine without a knowledge of standard medical writings is either a fool or a knave — either without the brains to understand science, or destitute of the honesty to deal fairly with men.

Hydropathy. — Or the plan of treating diseases by water. The singularly careful avoidance, by the whole medical faculty, for many ages, of the article of pure water as a medicinal, or, rather, health-imparting agent, was anything but creditable.

It is now admitted by all sensible men that water, cold and warm, used at proper times and to a reasonable extent, has great power over several diseases, and is a powerful promoter of health.

Homœopathy. — This mode of practice is of comparatively recent origin; but it has already sunk itself deep into the popular heart and has drawn to its support many of the wealthy, the cultivated, and the intelligent, in our most refined communities. They give

great attention to exercise, diet, etc., — which contribute very powerfully to preserve health, and to restore it when lost.

Eclectics. — There is a large growing class of physicians, called, at first, after the founder of the school, Thomsonians. Subsequently, they were generally known as Botanic Physicians. Now they pass under the title of Eclectics.

These men, directing their attention, at first, chiefly to cayenne and lobelia, have gradually extended their zealous researches over the vegetable kingdom, and have gathered much information worthy to be preserved.

The education and talents of this class of practitioners have gradually risen, year by year, until they have several medical schools, where students are well instructed in the principles of medicine, by men of ability. They have also good literature, especially in the department of *materia medica*. The list of remedies they have given to the world, drawn from our home plants, are of great value. We regard them as equal to all we were previously in possession of from the vegetable kingdom. The substitution of vegetable remedies, in most cases, for mercurials, cannot be too highly prized.

Physiologists. — Besides these various direct practitioners of medicine, there is the large and intelligent class of physiologists, including the phrenologists, who nearly discard medicine, and, appealing to the laws of life established by the Creator, urge temperance in eating and drinking; exercise in the open air; securing of pure air by ventilating dwellings, schoolhouses, and churches; bathing in cold and warm water; cheerfulness of mind; and the cultivation of the Christian virtues, as the only rational modes of securing health and life.

We confess we are inclined to forgive this class their error in banishing medicine, in view of their zeal and success in disseminating hygienic information of the utmost value and importance to mankind. Put man into harmony with nature, and establish over him the empire of reason, and their theory would be excellent; but as things are, medicines are “necessary evils.”

Progress of Medicine. — The art and science of medicine have made rapid progress in the last few years and are rapidly advancing.

The Chemistry of Man, commonly called Animal Chemistry, is opening new sources of light.

The result is that students have now before their minds, and are endeavoring to solve and act upon as fast as possible, inquiries and propositions like these:—

What is the chemical composition of the solids and fluids of the healthy human body?

What is the nature of the changes which occur in the composition of the solids and fluids during disease?

What alterations in the chemical composition of the solids and fluids take place during the operation of medicines?

Before it can exert any remote action on the animal economy, a remedy must be absorbed.

Before it can be absorbed, it must be soluble in the fluids of the living body.

Medicines are subject to chemical changes during their passage through the system.

These changes are regulated by ordinary chemical laws, and may, therefore, to some extent, be foretold and made available in the cure of disease.

These chemical laws are disturbed and varied, to some extent, by the law of vitality, — just as the magnetic needle is made to vary by disturbing forces.

What are these disturbances, and to what extent, and under what circumstances do they occur?

With these and similar inquiries and propositions before his mind, diligently studied, a physician can prescribe with intelligent aim. He will not know everything, to be sure, but what he does know he will have a reason for knowing. If he gives a medicine, he will have in view the chemical changes of the solids and fluids of the body, known to be produced by the disease he is combating. He will also keep in mind the solution of the medicine in the fluids of the body,

and the chemical reaction between its components and the acids, alkalies, etc., found in the alimentary tube and elsewhere.

As the science of medicine advances, and becomes liberal and eclectic in its character, gathering from all systems the best attested facts — medical practitioners, who would meet the wants of the age, must be men of progress. The light of to-morrow, with them, must modify and improve the light of to-day. They must knock every hour for admission into some new apartment of nature.

Need of Liberality. — That medical progress may be real, physicians must be free from bigotry. They must have no narrow prejudices against any man, or class of men; but be ready to examine candidly any new thought or new remedy brought to their notice, from whatever source it may come.

Conservative Leaders. — There are no influences which hold so steady a check upon medical progress as the conservative leaders in many of our medical associations. These men have strong faith in caste, and in the right of the few to govern the many. In the low places of society, they look for nothing but ignorance and poverty. These are the men who regard knowledge as a contraband article. They object very strongly to the enlightenment of *all classes* in Anatomy, Hygiene, and Medicine. This prejudice should be eliminated.

The True Physician. — How different the character of the true man and physician. He is genial in his disposition. He has no dislikes and antipathies, and hates no men except tyrants. He accepts knowledge, though it come from the humblest source; believing there is no experience but will repay a study of it, and no husbandman's ploughshare but turns up a soil worth analyzing. He belongs exclusively to no party, and can be approached easily by respectable men of every stamp.

What is now Wanted. — The foregoing remarks indicate one great leading want, in order that medical knowledge may increase. It is liberality in the true and full sense. We want true men in high places, who will let their light shine everywhere.

Beyond this, and of nearly equal importance with it, we want medical knowledge diffused among the people. We want — what the world has never seen — a popular medical literature. We want the temple of Esculapius pulled down, and the priests turned into the streets to become teachers of the multitude, rather than worshippers in the inner sanctuary.

We know this want will be stoutly denied, but not, we think, on well-considered grounds. We do not think it necessary to confine a knowledge of the soul to the ministers of religion. There is no branch of theology which we do not deem it proper for laymen to study; we even popularize it for our children. In the obscurest towns, laymen who follow the plough or push the plane, become, in many cases, eminent theologians. Why should they not study the lower science which relates to the body? They have not been able to heretofore, because its mysteries have been purposely hidden under technicalities.

It is said that those who begin to read upon medicine, are very apt to imagine themselves afflicted with the various symptoms they find described. To some small extent this is true; but it is also true that the light they obtain relieves them from many apprehensions which their previous ignorance allowed to prey upon them.

Some physicians oppose the popularizing of this kind of knowledge too often, we fear, upon the sordid ground of self-interest. They think their own services will be less sought.

We do not dispense with the services of ministers because the people study theology, neither shall we cease to employ teachers and practitioners of medicine when each man and woman is wise enough to study the healing art. The principal change we shall witness will be much larger attainments in knowledge among practitioners.

The teachers of any art or science are obliged to keep in advance of their pupils. Let medicine become a popular study, and we shall have very few ignorant physicians, and quackery will become one of the impossibilities. Homœopathists, Eclectics, Hydropathists, and

Physiologists believe in scattering medical books, stripped of their technicalities, among the multitude.

This is one of the missions of this book.

How many men understand the laws of health? How many women suffer untold agony through pure ignorance of their physical construction? Children are taught history, mathematics, and other branches of learning, but know absolutely nothing of their anatomy — the function of their stomach, lungs, brain, nerves or circulation. This being the case, is it a wonder so many boys and girls enter maturity unprepared physically for the duties demanded of them, and consequently suffer for their ignorance? How different and happier would their future life be if they were to receive proper physical care and given proper instruction.

This book is written in plain English, imparting knowledge indispensable to the family, father, mother, and children, who, by taking advantage of this opportunity, by careful and intelligent study, can learn how to avoid and ward off sickness and disease.

You must be very careful in taking medicine or in administering medicine to others unless you are sure that your diagnosis of the case is absolutely correct before doing so.

In taking or administering drugs, especially poisonous drugs, we hereby caution you *not to do so* except under the advice of a physician.

BROWN-FLYNN PUBLISHING CO.

WONDERS OF THE HUMAN BODY.

How to Keep Well.

DIGESTION of food, circulation of blood, inhaling-breathing in the aerial elements, is carried on through the wondrous mechanism of the vascular and nervous system of man's body.

The body, flesh, bone, blood, hair, nails, etc., is all that seers, philosophers, prophets, and alchemists have sought and sung throughout the centuries. But materialism forever looks away, here and there, for that which lies between the soles of man's feet and the crown of his head. In the language of Epictetus, "Unhappy man, thou carriest a god about with thee and knowest it not."

At maturity the human skeleton contains about 208 bones so delicately and perfectly adjusted that Science has despaired of ever imitating it. The muscles are about 500 in number. Length of alimentary canal 32 feet. Amount of blood in average sized adult 30 pounds, or one fifth the weight of the body.

The heart is six inches in length and four inches in diameter and beats 70 times per minute, 4200 times per hour, 100,800 per day, 36,720,000 per year; at each beat two and one half ounces of blood are thrown out of it, 175 ounces per minute, 656 pounds every hour, or about eight tons per day. All the blood in the body passes through the heart every three minutes. During 70 years the heart lifts 270,000,000 tons.

The lungs will contain about one gallon of air at their usual inflation.

We breathe, on an average, 1200 per hour and inhale 24,000 gallons per day.

The aggregate surface of air cells of the lungs exceeds 20,000 square inches, an area nearly equal to a room 12 feet square.

The average weight of the brain of an adult male is three pounds and eight ounces; female, two pounds and four ounces.

The female brain more than makes up in fineness of texture what it lacks in weight, compared with the male.

The nerves are all connected with the brain directly or by the spinal marrow.

The nerves, together with their branches and minute ramifications, exceed 10,000,000 in number, and form a body-guard greater than any army ever marshalled.

The skin is composed of three layers, and varies from one fourth of an inch to one inch in thickness. Its average area in an adult is estimated at 2,000 square inches. The atmospheric pressure being about 14 pounds to the square inch, a person of medium size is subject to a pressure of 40,000 pounds. Each square inch of skin contains 3,500 sweating tubes, or perspiratory pores, each of which may be likened to a little drain tile one fourth of an inch long, making an aggregate length, of all the pores placed end to end, 202,000 feet or about 40 miles.

The ashes of an average body weigh four to five pounds.

Air breathed into the arteries (air carriers — the ancients knew) unites with the cell, salts of iron, potash, lime, etc., the mineral base of blood, and is thus through the wondrous affinities and alchemical transmutations precipitated as flesh and bone by the same Infinite Intelligence that materializes vegetables, fruits, or flowers.

The organic portion of food, *i.e.*, the oil, albumen, fibrin, etc., is consumed, chemically burned in stomach and intestinal tract, to set free stored-up energy (motion) motive power to run the human machine, so the process of inhaling air — raw material for blood — may go on.

Through this chemical process of burning, called digestion, the mineral salts of iron, potassium, sodium, silica, lime, and magnesia are set free and enter the circulatory avenues through the delicate hair-like tubes that cover the mucous membrane of all internal viscera; these tubes are called absorbents. The mineral or cell salts are the foundation of blood.

Chemists now agree that there is but one substance known to man, and from it all things are made that are made.

The multiple forms of this substance constitute the visible universe.

The body of man is an epitome of the whole.

Mankind is on the verge of the discovery that the universe is a perfect machine, always in perfect order, and always running, and that all that is needed to supply man's every necessity is intelligent direction and adjustment of the machinery.

Man cannot create force — it eternally exists. Man can direct force for his benefit or pleasure just in the degree that he obtains knowledge of the nature and qualities of force.

Certainly the human body is fearfully and wonderfully made.

Children, when they reach the age of comprehension, should be taught the great importance and the wonderful working of their internal machinery, or in other words the use of their lungs, stomach,

liver, and kidneys, that they make proper use of them, thereby preserving their health, and growing to be strong men and women.

It is never too late to learn, and if you do not thoroughly understand your "internal machinery," you should certainly do so.

In the first place your external body should receive proper care. This is absolutely necessary and is the first law of health.

A sponge bath should be taken every morning; this opens the pores of the skin and allows it to throw off the poison which accumulates through the pores every twenty-four hours.

After you bathe, exercise your lungs by deep breathing. To do this, extend the hands straight in front of you, bringing them up over your head, at the same time taking a long deep breath; let the air out of your lungs slowly, as you lower your arms to your sides. Do this several times, as the average person is apt to acquire the habit of drawing the air very little into the lungs, but the fresh air should be drawn in full; way to the lower part or base of the lungs, for the blood receives the oxygen (which gives life to the blood) from the air, and to feed the blood properly, deep-drawn breaths should be taken frequently.

After this exercise drink a glass of pure fresh water, this will give you an appetite for breakfast, and before you sit down to the table just bear in mind that food is something like your coal-bin, and your stomach like your stove.

If you want a good fire in your stove you must put into it good clean wood and good coal, free from rubbish; therefore, put into your stomach proper food in a proper way, that your stomach may take good care of it, making good blood which is vitality.

Eat ripe fruit, good meat, oatmeal, eggs, etc., but never hot or soggy bread, and do not drink water with your meals; one cup of tea or coffee may be taken, but no more. Chew your food slowly and well; this causes the flow of saliva from the glands in the mouth and throat and sends the food to your stomach in proper condition for stomach and liver to take care of it.

The "liver" is the most wonderful organ of the body. All the corpuscles (solid particles in the blood) die every six weeks and have to be disposed of; the liver does most of this work, by grinding them up and working them over into something of use.

The red corpuscles have potash in them, which makes bile; this bile is a kind of lye which is a disinfectant; this passes into the small intestines and should destroy all the poisonous germs in the food before it passes into the blood.

If the liver does not do the work as it should the dead matter accumulates in the body instead of being discharged through the bowels, kidneys, and pores of the skin.

The liver is a closed door which keeps poisons out of the body. The kidneys, skin, and lungs are open doors to let the poison escape

from the body. When there comes such a pressure upon the liver from over-eating or too rich or poor food, it cannot keep the poison out, but lets it pass into the blood, so it is not purified.

This causes biliousness, a dull brain, yellow skin, dull eyes, the poison gets into the muscles, they become flabby and you feel weary and worn out. It gets into the nerves, causing sleeplessness, sciatica, and all nervous diseases. All the food taken into the stomach is filtered by the liver before it is absorbed. All impurities in food, and such as are in poor whiskey and tobacco, are filtered by the liver before passing into the general circulation; for instance, if whiskey when drank could immediately go to the brain without first being filtered through the liver, the drinker would fall dead soon after taking it.

A healthy liver full of "glycogen" (animal starch) made from the blood will destroy all poisons, but a poor and abused liver cannot do this; therefore, look well to your liver and keep it strong and healthful by good nourishing food, well cooked, well chewed, and at regular times of day for your meals.

The kidneys, as we said before, are one of the open doors through which part of the dead matter filtered through the liver is thrown out of the body through the urine (water); therefore keep the kidneys well flushed with pure water, drunk between meals, never with the meals. Every person should drink at least six glasses of water every 24 hours.

The bowels are the other open door through which the bulk of the waste matter passes from the body. They should be kept clear at regular intervals; the best time is in the morning immediately after breakfast.

As about nine tenths of the diseases flesh is heir to are caused by ignorant or wilful abuse of the stomach and liver, every person should make it their business to study themselves, their habits and appetites; and if wrong, correct them as far as possible, for good health is far better than riches.

We advise you to read carefully the chapter in this book on Anatomy and on Hygiene; it will help you to keep yourself and family well, and we cannot urge you too strenuously to study this book and make yourself familiar with it, so when sickness comes, as it surely will, you will find these articles on different diseases, which are all written by practicing physicians and specialists, will enable you to diagnose the case almost immediately, often saving long and protracted sickness and perhaps a cherished life.

We have scores of letters from fathers and mothers, even from physicians (who are strangers to us) from all parts of the country, speaking in the highest terms of this book and thanking us for the valuable advice and information received from it.

Therefore, study it; you will find it the best friend you ever had and sometime we believe you will say as many others do, "It's worth its weight in gold."

ANATOMY.

ANATOMY describes the structure and organization of living beings.

Special Anatomy treats of the weight, size, shape, color, etc., of each organ separately.

General Anatomy investigates the tissues or structures from which organs are formed.

Surgical Anatomy or Regional Anatomy considers the relations of organs to one another.

Physiological Anatomy treats of the uses or functions of organs in health.

Pathological Anatomy describes the alterations made upon different organs by disease.

We shall here introduce a very brief compendium only of Special Anatomy.

It is of great consequence that every person should have some knowledge of anatomy and physiology. Self-knowledge ought to extend to the body as well as the mind. To know one's self, physically, is to gain a new insight into that wonderfully skilful adjustment of means to ends which is never absent from the works of God. Without this knowledge, one cannot know how to take care of the health; and without health, life loses most of its value.

Structure of the Body.

THE human body is composed of solids and fluids.

The fluids are most abundant in children and youth. It is this which gives softness and pliancy to their flesh. In old age the fluids are less abundant, and the flesh is more hard and wrinkled.

The fluids contain the whole body, as it were, in a state of solution; or rather, they hold the materials out of which it is manufactured.

Chemical Properties of the Body.

THE four elements, oxygen, hydrogen, carbon, and nitrogen, make up nearly the whole bulk of the fluids and soft solids of the human body. A number of other elements, chiefly in a state of combination, and in much smaller quantities, enter into several of the tissues.

Binary Compounds. — Thus, we have *carbonic acid* in blood, urine and sweat; and we have *water* universally diffused through the system, — each of these substances being a *binary* compound, that is, composed of two elements.

Compounds of more than two Elements are widely distributed over the body; as,

Carbonate of Soda in serum, saliva, bile, mucus, sweat, and tears.

Carbonate of Lime in cartilage, bone, and teeth.

Phosphate of Lime in bones, teeth, and cartilage.

Phosphate of Iron in blood, gastric juice, and urine.

Chloride of Sodium in blood, brain, muscle, bone, cartilage and pigment.

Chloride of Potassium in blood, gastric juice, milk, and saliva.

Chloride of Calcium in gastric juice.

Sulphate of Potassa in urine, gastric juice, and cartilage.

Sulphate of Soda in sweat, bile, and cartilage.

Sulphate of Lime in bile, hair, and scarf-skin.

Oxide of Iron in blood, black pigment, and hair.

Organized Compounds. — Besides the above inorganic elements and compounds, several organized substances, or *proximate elements*, as they are called, exist largely in the body. The chief of these are albumen, fibrin, gelatin, mucus, fat, and casein. Others need not be named.

Albumen is found in great abundance in the human body. It is the raw material out of which the flesh and other tissues are made. The white of an egg, which is nearly pure albumen, is a good specimen of it.

Fibrin, when removed from the human body, changes from a soluble to an insoluble state. In other words, it coagulates in a kind of net-work. Nearly the same thing takes place constantly in the living body, when the liquid fibrin leaves its soluble state, and is deposited as solid flesh. Fibrin bears the same relation to albumen that woolen yarn does to wool; it is spun from it in the busy wheel of organic life. And the flesh or muscle is related to fibrin as the cloth is to yarn; it is woven from it in the vital loom. Fibrin has been called *liquid flesh*.

Gelatin exists largely in the ligaments, cartilages, bones, skin, and cellular tissue. When dissolved, five parts in one hundred of hot water, it forms a thick jelly. *Isinglass* is a form of gelatin obtained from the air-bladder of the sturgeon and the codfish. Glue is still another form of gelatin. It is extracted from the bones, and parings of hides, and the hoofs and ears of cattle, by boiling in water. Black silk, varnished over with a solution of gelatin, forms *court-plaster*.

Mucus is a sticky fluid secreted by the gland-cells. It is spread over the surface of the mucous membranes, and serves to moisten and defend them from injury.

Fat consists of cells held together by cellular tissue and vessels, and contains glycerin, stearic acid, margaric acid, and oleic acid. It has no nitrogen. If the stearic acid be in excess, the fat is hard; if the oleic acid preponderate, it is soft. The stearine extracted from fat is used for making very hard candles.

Casein is abundant in milk and constitutes its curd. It is held in solution in milk by a little soda. When dried, it is cheese. It is found in blood, saliva, bile, and the lens of the eye. It forms the chief nourishment of those young animals which live on milk. It is found in peas, beans, and lentils. Vegetable and animal casein are precisely alike in all their properties. Fibrin and albumen contain almost exactly the same amount of oxygen, hydrogen, carbon, nitrogen, and sulphur, which is found in casein. This latter, when taken into the stomach, therefore, goes, without much change, to the formation of the albumen and fibrin of the body.

Physical Properties of the Body.

The Tissues.—The solid organized substances of which the human body is composed, are called *tissues*. There are various kinds of tissues.

The Cellular Tissue, commonly called *areolar*, is made up of small fibres and bands woven together into a sort of net-work, with numerous little spaces opening into each other. These spaces are filled with a watery fluid; and when this is greatly increased by disease, so as to cause the parts to swell, and the skin to shine, the person has *anasarca*, or cell-dropsy. The uses of this tissue are to give parts and organs a kind of elastic cushion to rest upon, so that they may not be bruised and injured by the shocks of life; to make a kind of safe highway for delicate vessels to pass from one part of the body to another; and to furnish a beautifully arranged lodgment for the watery fluid which gives such roundness, smoothness, and grace to the human form. The opening of the cells into each other explains the reason why feeble persons have swelled feet and ankles in the evening, and not in the morning—the fluid settling down from cell to cell, into the lowest parts, while they are up during the day, and running back to its proper place while they are lying down during the night.

The Mucous Tissue, or *mucous membrane*, lines all the cavities which communicate with the air, as the mouth, stomach, bowels, lungs, etc. It is supplied with numerous small glands which secrete a sticky kind of fluid called *mucus*, to protect the surface from any injury which might be inflicted by air, or by irritating substances suspended in it.

The Serous Tissue, or *membrane*, lines all the cavities which do not communicate with the air, that is, all those which are shut, and have no outward opening. The skull, the chest, and the belly are lined by this kind of membrane. The membrane itself forms a closed sac, —one layer of it being attached to the cavity it lines, while the other is folded back upon and around the contents of the cavity, which are left outside of the sac. A watery fluid oozes from the inner surface of the sac, to make its sides glide easily upon each other. When some disease causes this water to be poured out too freely, so as to fill or partly fill the cavity, we have dropsy of the brain, or chest, or abdomen, as the case may be.

The Dermoid Tissue covers the whole outside of the body. We call it the *skin*, or *cutis*. It is similiar in structure to the mucous membranes, which are a mere continuation of it. It is harder than the mucous membrane, because more exposed to injury. In health, it never ceases to secrete and throw off a fluid which we call insensible perspiration while it is in the form of an invisible vapor, and perspiration, or sweat, when it is so increased as to be seen. So great is the sympathy between this dermoid covering of the body and the mucous membranes, that when it is *chilled* so as to stop the invisible perspiration, the internal membrane becomes affected, and we have a sore throat, or diarrhoea, or running at the nose; that is to say, when the skin cannot sweat, the mucous membrane begins to sweat.

The Fibrous Tissue consists of closely united fibres, and for whatever purpose used, forms a fine, dense, and enduring body. In some cases it takes the form of a membrane, as the *dura mater*, which lines the interior of the skull and spinal column. The *ligaments* which hold the bones together, and the *tendons* or *cords*, which fasten the muscles to the bones, are fibrous bodies. It is this firm substance of which rheumatism frequently takes hold, and this is the reason why it lingers so much about the joints. It sometimes takes hold of the ligament which fastens the deltoid muscle to the bone of the upper arm, about two-thirds of the way from the elbow to the shoulder. This muscle *lifts up* the arm. In this form of rheumatism, therefore, the arm hangs helpless at the side.

The Cartilaginous Tissue covers the ends of the bones where they come together to make a joint. It is well fitted to make the joint work easy, being smooth, hard, and elastic.

The Osseous or Bony Tissue varies in its composition, density, and strength, according to the age of the person, and the uses of the bone.

The Muscular Tissue, or *muscle*, being made for a great deal of pulling and lifting, is formed something like a rope, except that there is no twisting. Many small fibres or filaments unite to form fasciculi. A fasciculus is a bundle of fibres surrounded by a delicate layer of cell-tissue called *sarcolemma*,—just as a cord is a number of smaller threads of cotton or hemp bound together. A number of these fasciculi united together make a muscle,—just as several cords, called strands, twisted together, make a rope. Figure 1 gives us a good view of the fibres and bundles, highly magnified.

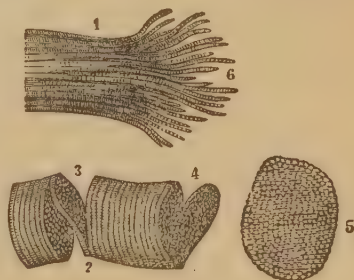


FIG. 1.

The Adipose Tissue is the material which the human body works up into pots and cells containing *fat*. It is found chiefly under the skin and muscles of the belly, and around the heart and kidneys. By the increase of this tissue, persons may become enormously enlarged without having their muscles at all increased in size. Such a condition is to be deplored, — the body having become merely the storehouse or depot of myriads of pots of fat.

The Nervous Tissue is composed of two distinct kinds of matter, — the one gray and pulpy, called *cineritious*, the other white and fibrous, called *medullary*. The external part of the brain and the internal portion of the spinal cord are composed of the gray or ash-colored tissue; the nerves are made only of the white or fibrous matter, and are inclosed in a delicate sheath called *neurilemma*.

Vital Properties of the Body.

BODIES begin their growth with a simple *cell*, which is a delicate little bladder or shut sac. Cells take their rise in that portion of the blood which is capable of being *organized*, and which is called *Blastema*.

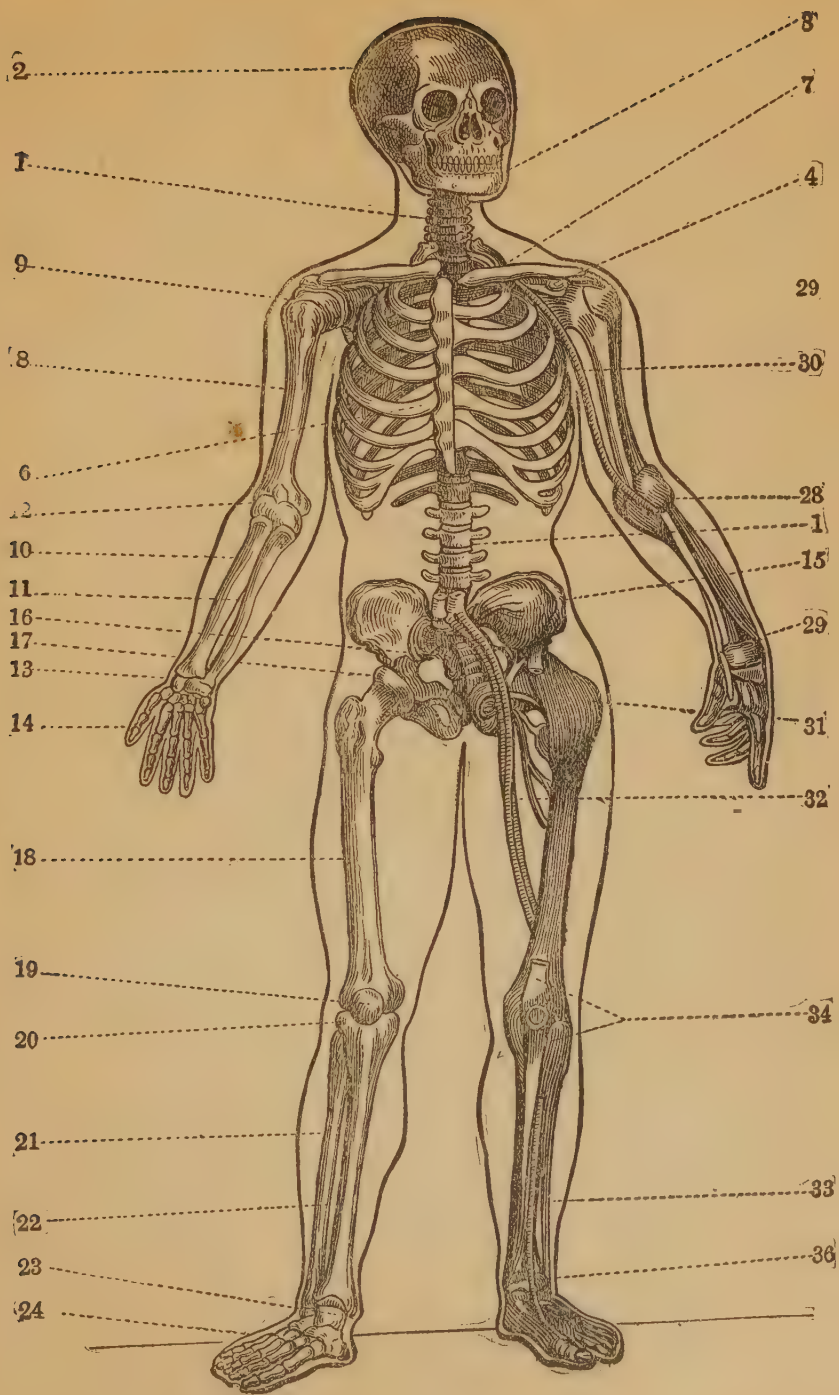
In animal bodies each cell generally begins as a minute point in the blastema, and grows until a transparent bladder or vesicle springs out from one side of it, and soon appears to enclose it. The bladder is then called the cell, and the point or dot is its *nucleus*. Within this nucleus appears another dot, which is called the *nucleolus*. When fully ripened, the cell bursts and sets the nucleus free, and this, in its turn, matures and yields up its contents. Thus all cells have their origin in germs produced by previously existing parent-cells. They are multiplied with great rapidity. Having grown to a certain extent, they lose their fluid contents, and their walls collapsing or coming together, they form simple membraneous discs. In this way, with some variations, the simple tissues of the body begin to be, and the foundation is laid for the noble structure of man.

Anatomy of the Bones.

THE human skeleton is composed of two hundred and eight bones, the teeth not included.

When fastened together by natural ligaments, the bones are said to form a *natural skeleton*; when attached by wires, an *artificial skeleton*.

In Figure 2, — 1, 1, represent the spinal column; 2, the skull; 3, the lower jaw; 4, the breast-bone (sternum); 6, the ribs; 7, the collar-bone; 8, the bone of the upper arm (humerus); 9, the shoulder-joint; 10, the radius; 11, the ulna; 12, the elbow-joint; 13, the wrist; 14, the hand; 15, the haunch-bone; 16, the sacrum; 17, the hip-joint; 18, the thigh-bone; 19, the knee-cap (patella); 20, the knee-joint; 21, the fibula; 22, the tibia; 23, ankle-joint; 24, the foot; 27, 28, 29, the ligaments of the shoulder, elbow, and wrist,



30, the large artery of the arm; 31, the ligaments of the hip-joint; 32, the large blood-vessels of the thigh; 33, the artery of the leg; 34, 35, 36, the ligaments of the knee-cap, knee, and ankle.

The protuberances or swellings in certain parts of the bones are called processes, and are the points to which muscles and ligaments are fastened.

The bones are supplied with nutritive vessels, and, like other parts of the body, are formed from the blood. At first they are comparatively soft and cartilaginous. After a time, in the young animal, they begin to change to bone at certain places, called *points of ossification*. They are covered with a strong, fibrous membrane called the *periosteum*. A somewhat similar covering upon the cartilages has the name of *perichondrium*, and that which covers the skull is the *pericranium*.

The bones are compounded of earthy and animal matter. From the former — phosphate and carbonate of lime — they receive their strength; from the latter — cartilage — they derive their life.

Put a bone for a few days into diluted muriatic acid, — one part of acid to six of water, — and the phosphate and carbonate of lime

will all be removed, while the bone will remain the same in shape. It will now be comparatively soft, and may be bent, or even tied into a knot without breaking. Place a similar bone in the fire for a few hours, and it will also retain its shape, but the cartilaginous portion will be gone. It is now brittle, and may be

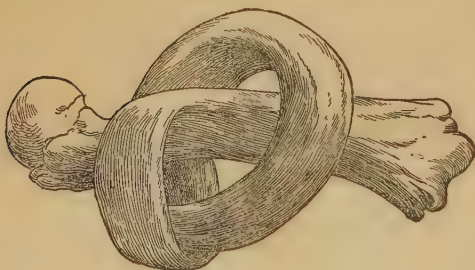


FIG. 3.

picked in pieces with the fingers.

The bones are divided into those of the head, *thirty*; of the body, *fifty-four*; of the upper limbs, *sixty-four*; and of the lower limbs, *sixty*.

Bones of the Head.

THE bones of the head are divided into those of the *skull*, the *ear*, and the *face*.

The skull has eight bones. They are composed of two plates, one above the other, with a *porous* partition between. These two plates are capable of giving the brain very powerful protection against injury, the outer one being fibrous and *tough*, — the inner one, hard and *glass-like*, and hence called *vitreous*.

The middle layer has the name of *diploe*. Its spongy nature deadens the jar from a blow inflicted upon the outer table. In early life, when the bones are tender and yielding, this porous layer is not needed, and is not found.

That the bones of the skull may not easily slip by each other, and get out of place, they are *dovetailed* together in curious lines called *sutures*. In advanced years, these generally close up, the bones uniting firmly together. In early life they are quite open, the firm bones not covering the whole brain. The opening of the coronal suture in childhood is called a *fontanelle*. It presents a soft place upon the top of the head, where the finger could be pressed down into the brain. In Figure 4,—1, 1, show the coronal suture on the front and upper part of the skull; 2, the sagittal suture on the top of the skull; and 3, 3, the lambdoidal suture, running down on each side of the back part of the skull.

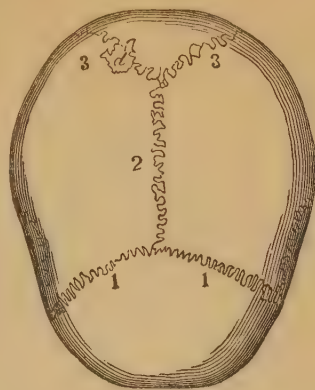


FIG. 4.

Figure 5 shows the skull-bones separated from each other at the sutures: 1, the frontal bone; 2, the parietal; 2, the occipital; 4, the temporal; 5, the nasal; 6, the malar; 7, the superior maxillary; 8,

the unguis; 9, the inferior maxillary. Arnott has demonstrated that the form of the skull is the best possible for sustaining weights, and resisting blows. The summit of the head is a complete arch, like that of a bridge.

The ear has four small bones, which aid the sense of hearing.

The bones of the face are fourteen in number. They hold the soft parts in place, and aid in grinding the food.



FIG. 5.

Bones of the Trunk.

IN the trunk there are twenty-four ribs; twenty-four pieces in the backbone or spinal column; four bones in the pelvis and hips; one breast-bone, called sternum; and a bone at the base of the tongue, called os hyoides. They are so put together as to form two great cavities, namely, the thorax or chest, and the abdomen or belly.

The *ribs*, connecting with the backbone behind and the breast-bone in front, form the thorax, which contains the lungs and heart. Fig.

6 shows the natural form of the healthy chest: 1, is the spine; 2, 2, the collar-bones; 3, 3, the seven upper, or true ribs; 4, 4, the five lower or false ribs; 5, the breast-bone, to which the true ribs are

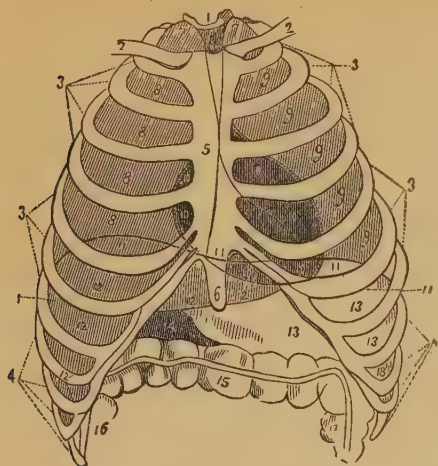


FIG. 6.

united; 6, the sword-shaped cartilage which constitutes the lower end of the breast-bone, called *ensiform cartilage*; 7, 7, the upper part of two lungs; 8, 8, the right lung, seen between the ribs; 9, 9, the left lung; 10, 10, the heart; 11, 11, the diaphragm, or midriff; 12, 12, the liver; 13, 13, the stomach, 14, 14, the second stomach, or duodenum; 15, the transverse colon; 16, the upper part of the colon on right side; 17, upper part of colon on left side.

Each piece of the spinal column is called a *vertebra*. Upon every one of these are seven

projections, called *processes*—a part of which are for linking the bones together, and the rest to furnish attachments for the muscles of the back.

The projections are linked together in such a way, that a continuous channel or opening runs down through the whole, in which is lodged the spinal cord, or *medulla spinalis*. This nervous cord is connected with the base of the brain, and is a kind of continuation of it.

Between all the *vertebræ* are certain cartilaginous cushions, which, when compressed, spring back, like India rubber, and thus protect the brain from being injuriously jarred by running, leaping, or walking.



FIG. 7.



FIG. 8.

The *pelvis* has four bones: the two nameless bones—*innominata*, the *sacrum*, and the *coccyx*. In the side of each of the nameless bones is a deep, smooth cavity, called the *acetabulum*. Into this the round head of the thigh-bone is nicely fitted. When the bone is thrown out of this cavity, the hip is said to be out of joint. The *sacrum* took its name

from the fact that the heathens used to offer it in sacrifice. With them, it was the sacred bone. The coccyx is the lower termination of the backbone. These bones are represented in Fig. 8: 1, 1, being the innominate; 2, the sacrum; 3, the coccyx; 4, 4, the acetabulum: *a, a*, the pubic portion of the nameless bones; *d*, the arch of the pubes; *e*, the union of the sacrum and the lower end of the spinal column.

Bones of the Upper Extremities.

THE *shoulder-blade* (scapula), the *collar-bone* (clavicle), the *bone of the upper arm* (humerus), the *two bones of the forearm* (ulna and radius), the *bones of the wrist* (carpal bones), the *bones of the palms of the hand* (metacarpal bones), the *bones of the thumb and fingers* (phalanges),—these are the bones of the upper limbs.

The *collar-bone* is fastened at one end to the breast-bone, at the other end to the shoulder-blade. It keeps the shoulders from dropping forward. Many persons allow it to fail of this end by getting very much bent in early life. This happens at school, when children are allowed to sit in a stooping posture. In the French, a race remarkable for a straight, upright figure, this bone is said to be longer than in any other people.

The *shoulder-blade* lies upon the upper part of the back, forming the shoulder. It has a shallow cavity (glenoid cavity), into which is inserted the head of the upper arm-bone. Several strong muscles are attached to the elevations of this bone, which keep it in its place, and move it about as circumstances require.

The *upper arm-bone* has its round head fastened in the glenoid cavity, by the strong capsular ligament, forming a joint capable of a great number of movements. At the elbow it is united with the *ulna* of the fore-arm. It is a long, cylindrical bone, represented by Fig. 9: 1, is the shaft of the bone; 2, the large, round head which fits into the glenoid cavity; 3, the surface which unites with the ulna.

Of the two bones of the fore-arm, the *ulna* is on the inner side, and unites with the humerus, making an excellent hinge-joint. The other bone of the fore-arm, the *radius*, lies on the outside of the arm, — on the same side with the thumb, — and unites, or articulates, as we say, with the bones of the wrist. In Fig. 10: 1, is the body of the ulna; 2, the shaft of the radius; 4, the articulating surface, with which the lower end of the humerus unites; 5, the upper extremity of the ulna, called the olecranon process, which forms the elbow-joint; 6, the point where the ulna articulates with the wrist.



FIG. 9.



FIG. 10.

The eight bones of the *wrist* or *carpus* are ranged in two rows, and being bound close together, do not admit of very free motion. In Fig. 11: *s*, is the scaphoid bone; *L*, the semilunar bone; *c*, the cuneiform bone; *P*, the pisiform bone; *T*, *T*, the trapezium and trapezoid bones; *M*, the os magnum; *U*, the cuneiform bone. The last four form the second row of carpal bones. 11, 11, are the metacarpal bones of the hand; 2, 2, the first range of the finger-bones; 3, 3, the second range of finger-bones; 4, 4, the third range of finger-bones; 5, 6, the bones of the thumb.

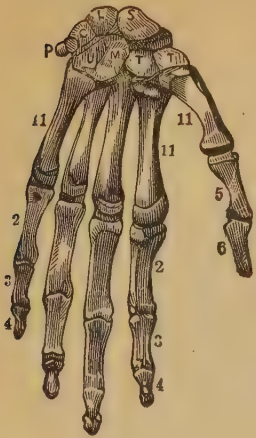


FIG. 11.

Of the five metacarpal bones, four are attached below to the first range of the finger-bones, and the other to the first bone of the thumb, while the whole are united to the second range of the carpal bones above.

Bones of the Lower Extremities.

THESE are the *thigh-bone* (femur), the *knee-pan* (patella), the *shin-bone* (tibia), the *small bone of the leg* (fibula), the *bones of the instep* (tarsal bones), the *bones of the middle of the foot* (metatarsal bones), and the *bones of the toes* (phalanges).

The *thigh-bone* is the longest bone in the system. Its head, which is large and round, fits admirably into the cavity in the innominatum, called acetabulum, and forms what is called a ball-and-socket joint. In Fig. 12: 1, is the shaft of the thigh-bone (femur); 2, is a projection called the trochanter minor, to which some strong muscles are attached; 3, is the head of the femur, which fits into the acetabulum; 5, is the external projection of the femur, called the external condyle; 6, the internal condyle; 7, the surface which articulates with the tibia, and on which the patella slides.

The *knee-pan* or *knee-cap* (patella) is placed on the front of the knee, and being attached to the tendon of the extensor muscles above, and to the tibia by a strong ligament below, it acts as a pulley in lifting up the leg.

The *shin-bone* (tibia) is the largest of the two in the lower leg, and is considerably enlarged at each end.

The *small bone of the leg* (fibula) lies on the outside, and is bound to the larger bone at both ends. Fig. 13 shows the two bones of the leg: 1, being the tibia; 5, the fibula; 8, the space between the two; 6, the junction of the tibia and fibula at the upper extremity; 3, the internal ankle; 4, the lower end of the tibia that unites

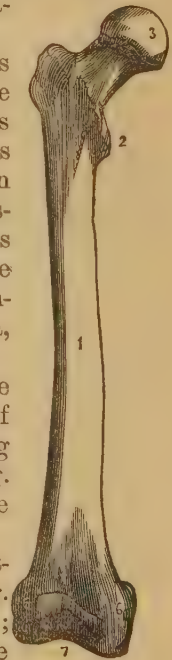


FIG. 12.

with one of the tarsal bones to form the ankle-joint; 7, the upper end of the tibia, which unites with the femur.

The *instep* (tarsus) has seven bones, which, like those of the wrist, are so firmly bound together as to allow but a limited motion.

The *metatarsal bones*, corresponding with the palm of the hand, are five in number, and unite at one end with the tarsal bones, and at the other with the first range of the toe-bones.

The tarsal and metatarsal bones are put together in the form of an *arch*, the spring of which, when the weight of the body descends upon it in walking, prevents injury to the organs above. (Fig. 14.)

The *phalanges* have fourteen bones. The great toe has two ranges

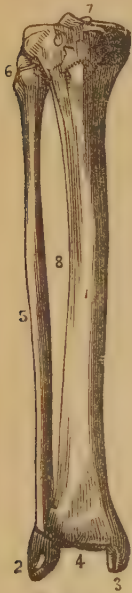


FIG. 13.

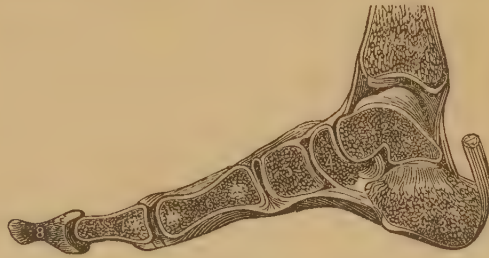


FIG. 14.

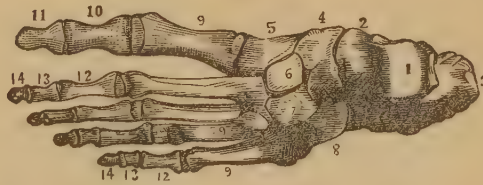


FIG. 15.

of bones; the other toes have three. Fig. 15 gives a view of the upper surface of the bones of the foot: 1, is the surface of the astragalus where it unites with the tibia; 2, the body of the astragalus; 3, the heel-bone (os calcis); 4, the scaphoid bone; 5, 6, 7, the cuneiform bones; 8, the cuboid; 9, 9, 9, the metatarsal bones; 10, the first bone of the great toe; 11, the second bone; 12, 13, 14, three ranges of bones forming the small toes.

The Joints.

THAT bones may be of any use, they must be jointed together. Joints are of the greatest importance. It is necessary they should be so constructed that there shall be no harsh grating of the bones upon each other, and no injurious jars in walking, etc. To prevent these things, a hard, smooth, and yet yielding, cushion-like substance is

required between them in joints. Such are the *cartilages*. Fig. 16 gives a specimen of these intervening cartilages. D, is the body of a bone, at the end of which is a socket; C, the cartilage lining the socket, thin at the sides and thick in the centre; B, the body of a bone, at the end of which is a

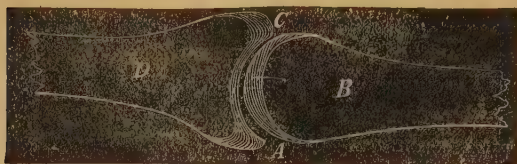


FIG. 16.

round head; C, the investing cartilage, thin at the sides and thick in the centre.

Cartilage grows thinner, harder, and less elastic in old age. Hence old people are not quite as tall as in middle life, and a little stiffer in their joints.

The *synovial membrane* is a thin layer covering the cartilage, and being bent back upon the inner surface of the ligaments, it forms a closed sac. From its inner surface a sticky fluid oozes out, which helps the joints to play easily.

There are other smaller sacs connected with the joints, called *bursa mucosæ*. They secrete a fluid similar to that from the synovial membrane.

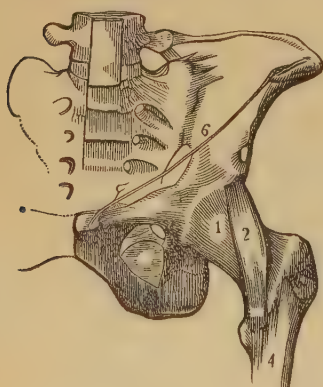


FIG. 17.



FIG. 18.

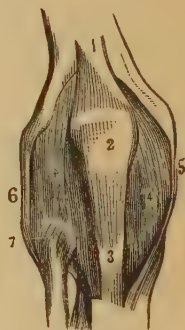


FIG. 19.

The ligaments. To retain the bones in their places at the joints, some strong, flexible straps are required to stretch across from one to the other, and to firmly unite them. Such are the ligaments.

They are the pearl-colored, lustrous, shining parts about the joints, in the form of straps and cords. There are a number of them so woven together as to form a complete covering of the joint, called a capsular ligament. In Fig. 17: 1, 2, are ligaments extending from the hip-bone, 6, to the femur, 4. In Fig. 18: 1, is the socket of the hip-joint; 2, head of the femur, lodged in the socket; 3, the ligament within the socket. In Fig. 19: 1, is the tendon of the muscle which extends the leg; 2, the knee-cap (patella); 3, the anterior ligament

of the patella; 6, the long external lateral ligament; 4, 4, the synovial membrane; 5, the internal lateral ligament; 7, the anterior and superior ligament that unites the tibia with the fibula.

Uses of the Bones.

THE bones are to the body what the frame is to the house. They hold up and retain the other parts in their proper places. They furnish points of attachment for the muscles, to hold the body together and to give it motion. They also furnish strong, bony cavities for the lodgment and protection of such delicate organs as the eye, the brain, and the heart.

A single bone, examined by itself, might not seem to have much beauty or design about it; it might even look clumsy and misshapen. But when all the bones are inspected with reference to each other, we immediately discover a general plan upon which they are made, and are compelled to admire their beautiful harmony, and the symmetrical grace with which they act. They show us that God can command our wonder, even in the bony frame of our bodies.

The Muscles.

THAT part of the animal's body which we call lean meat is composed of muscles. We have already explained that muscles are composed of threads, etc., put together in great numbers, forming bundles. So numerous are these threads and bundles in some cases, that the muscles which are composed of them have a strength truly wonderful.

Toward the end of the muscle, the fibres cease, and the structure is so modified as to become a white cord of great density and strength. This cordy substance is fastened to the bone so strongly, that it is impossible, except in some rare cases, to detach it. Generally the bone will sooner break than this attachment will give way. Sometimes this cord spreads out like a membrane. It is then called *fascia* or *aponeurosis*.

The fibres of a muscle have the peculiar property of *contracting* under a nervous stimulus sent to them by the will. These contractions cause them to act as pulleys, and to move the bones, and consequently the limbs and body, in such direction as the will commands. This is the special use of the muscles. All our movements are caused by them. They pull us about, not blindly and at a random, but under the direction of an intelligent will.

The manner in which a muscle acts, with the cord attached, may be seen by examining the leg or "drum-stick" of a fowl. If the cord on one side be pulled, the claws are shut; if that upon the other side be drawn, they will open. If both be pulled, they are held fast in one position, neither opening nor shutting.

An examination of a piece of boiled lean meat will show the

threads of which it is composed. With proper instruments, these may be unravelled, as it were, until fibres will be found not larger than a spider's web. These, covered with sheaths of great delicacy, extend beyond the fleshy fibre, and with the cell-substance connecting the fibres, are condensed into tendon.

Millions of these sheathed fibres are gathered into a bundle, and covered with a sheath, and thus form what is called a *fasciculus*. A muscle is a number of these fascicula made into a bundle, and covered with a sheath called a *fascia* (Fig. 1).

The arm is a number of muscles bundled together, and covered, likewise, by a fascia.

The fibres in a fasciculus being parallel, act together. But the fasciculous bundles which make up a muscle act in various ways.

Shape of the Muscles.—Some muscles are fusiform or spindle-shaped, so that the attachment occupies but a small space (Fig. 20).



FIG. 20.

Other muscles are radiate or fan-shaped (Fig. 21). Such is the temporal muscle, the thin edge of which is attached to the side of the head, without producing an elevation or deformity.

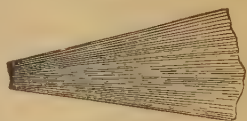


FIG. 21

In some cases the fasciculi are arranged upon one or both sides of a tendon. In this way a great number may concentrate their action upon a single point. Such muscles are called *penniform*,—being shaped like a feather (Fig. 22).



FIG. 22.

In other instances, the fasciculi form circular muscles,—*orbiculares*, or *sphincters*, as they are called. These surround certain openings into the body, which they are designed to close, either in whole or in part. They surround the eyelids, the anus, the mouth of the womb, etc. (Fig. 23).



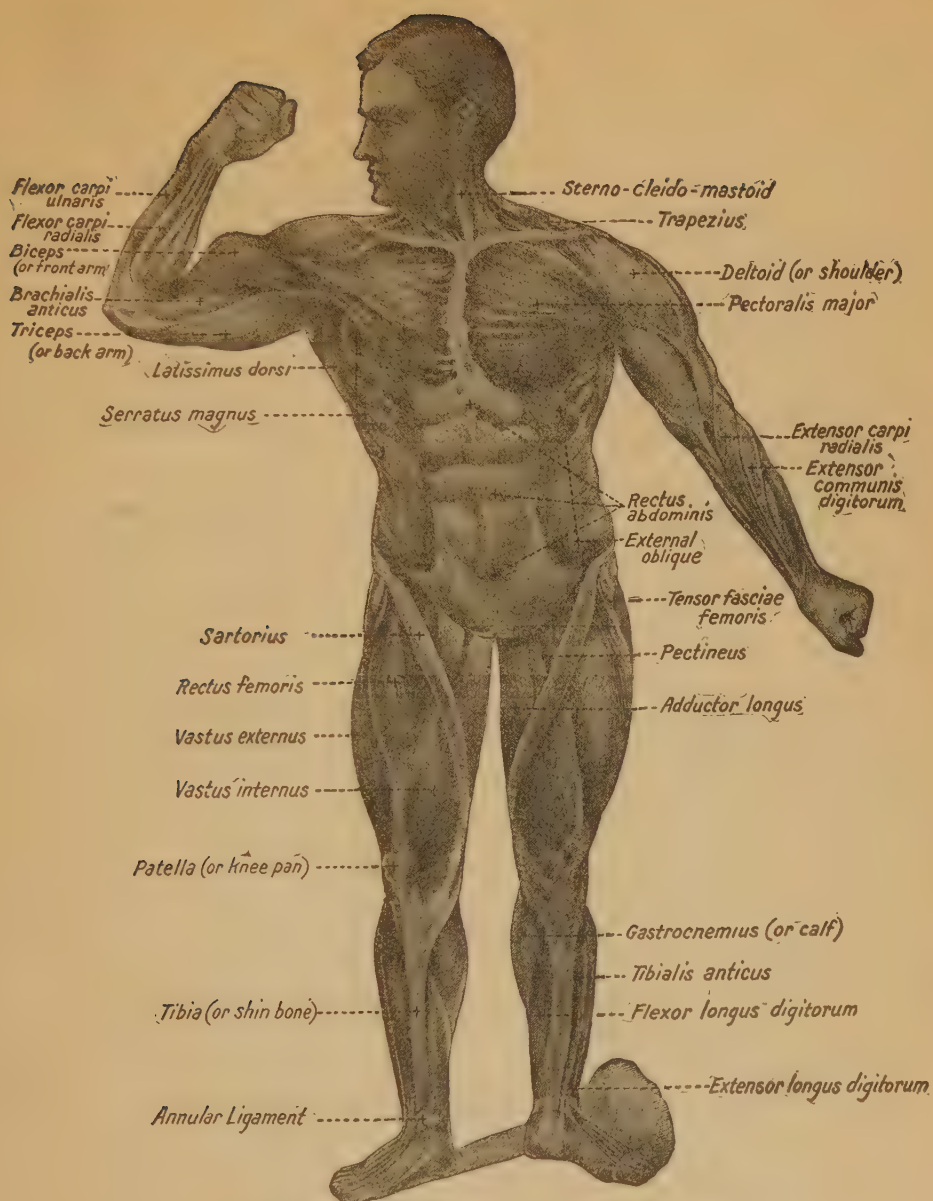
FIG. 23.

In still other instances the fasciculi are ranged side by side in rings, forming muscular tubes. By the successive contraction of these rings, any substance is driven through the tube,—as food or drink through the gullet of a cow. Fig. 24 is a section of the gullet: *a*, *b*, show the circular fibres; *c*, the longitudinal.



FIG. 24.

Sometimes the fasciculi curve around in parallel layers or interlace with each other, forming a bag or pouch. By the contraction of these fasciculi, the contents of the bag will be turned from side to side as in the case of the stomach, or driven out, as in that of the heart. Fig. 25 shows the muscles of the stomach: *L*, represents the fibres running in one direction; *c*, in another; *E*, lower end of gullet; *o*, pylorus; *D*, beginning of duodenum, or second stomach.



The Muscles of the Human Body.



The Muscles of the Human Body:

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Number of Muscles. — The muscles of the body are as numerous as the ropes of a ship, — there being five hundred or more. Some anatomists reckon more, some less.

They are divided into those of the *head and neck*, those of the *trunk*, those of the *upper extremities*, and those of the *lower extremities*.

They are too numerous to be named and individually described in this brief account of them. A part of them are voluntary, that is, under the control of the will; while another part are involuntary, moving without reference to the will. The heart is of the latter kind, it being necessary for it to keep moving when the will and mind are asleep.

On the back there are six layers of muscles, one above another. Such a number are necessary to perform the numerous movements of the back, neck, arms, etc. Every expression of the human face, as joy, sorrow, love, hate, hope, fear, etc., is produced by the gentle pulling of muscles, made expressly to indicate these emotions.

The *diaphragm* is a large flat muscle, reaching across the great cavity of the body, and dividing the chest from the abdomen. It is penetrated by the gullet going to the stomach, and by the great blood-vessels leading to and from the heart. It is shaped like the cover of a dinner-dish, the convex surface being turned up. When the breath is drawn in, it sinks down towards a level, thus enlarging the chest at the expense of the belly. When the breath is thrown out, the reverse takes place.

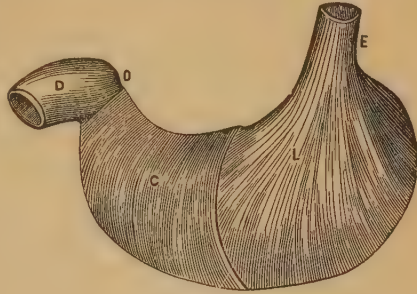


FIG. 25.

Mode of Action. — The *contractibility* of a muscle, of which I have spoken, is simply its power of *shortening* itself. The hand is raised

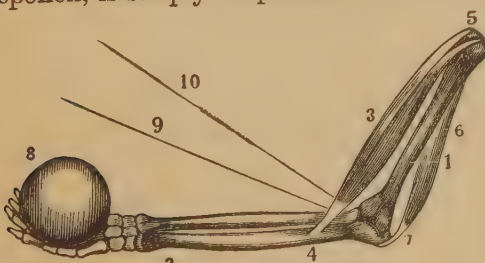


FIG. 26.

5 by the shortening of a muscle in front, attached to the bone above the elbow, and to a bone below the elbow. The contraction of an antagonistic muscle behind, also attached above and below the elbow, brings the hand back to its place. Fig. 26 shows how all joints are moved: 1, is the bone of the arm above the elbow; 2, one of the bones below the elbow; 3, the muscle which bends the elbow; 4, 5, attachments of muscles to bones; 6, the muscle that extends the

elbow; 7, attachment to elbow; 8, weight in hand. The muscle, 3, contracts at the central part, and brings the hand up to 9, 10.

The complication, variety, and swiftness of motion, executed by muscles, are past conception. Every movement which a human being makes, from the heavier motions of the farmer in cultivating his fields, up to the magic touches of the painter's brush, and the methodical frenzy with which the great master's fingers sweep the piano, are all made by muscles obeying an intelligent will.

The Teeth.

THE teeth are not like other bones, either in composition, method of nutrition, or growth. When broken they do not unite, not being furnished with the necessary power of reproduction of lost parts.

Both the upper and lower teeth are set into bony sockets, called alveolar processes. These, with the fibrous gums, give the teeth a very firm setting.

Origin.—The teeth have their origin in little membranous pouches within the bone of the jaw, which, in their interior, have a fleshy bud. From the surface of this the bone or ivory exudes. The tooth and the bony socket are developed and rise up together, — the former, when sufficiently long, pushing itself through the gum.

Number.—The first set of teeth are only temporary, and are called *milk-teeth*. There are but twenty of them. Between the age of six and fourteen, these become loose, and drop out, and the permanent teeth appear in their places. Of these there are thirty-two, sixteen in each jaw.

Names.—The four front teeth in each jaw, *a, b*, Fig. 27, are the *cutting teeth* (incisors); the next one, *c*, is an *eye-tooth* (cuspid); the

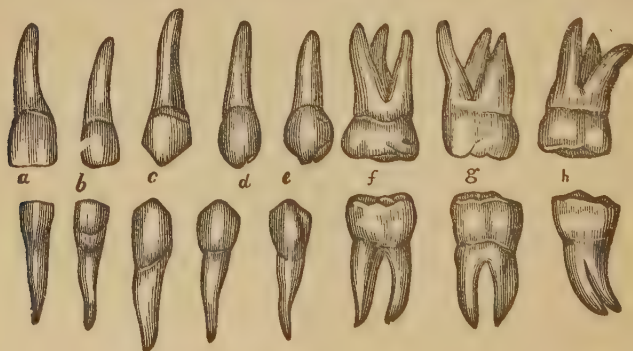


Fig. 27.

next two, *d, e*, are *small grinders* (bicuspid); the last three, *f, g, h*, are *grinders* (molars). One appears late on each side, from the age of twenty to twenty-four, and is called *wisdom tooth*.

Composition.—A tooth is composed of *ivory* and enamel. The internal part is ivory, which is harder than bone. The coating upon the surface is *enamel*, which is still harder than ivory. That part which rises above the jaw-bone is called the *crown*; it is this only which is covered with enamel. The part within the jaw is called the *root* or *fang*; this is composed of bony matter, through which small vessels pass in to nourish the tooth. Small white nerves also pass into the tooth, — of the presence of which we have terrible evidence in tooth-ache.

Use of the Teeth.

THE incisors cut the food asunder; the molars break down its solid parts, and grind it to a fineness which fits it for the stomach.

In masticating the food, the lower jaw has two movements, the up-and-down motion, like a pair of shears, and the lateral or grinding motion. These two movements are performed by different sets of muscles. Flesh-eating animals have only the up-and-down motion; vegetable-eating animals have only the lateral or grinding motion; while man has both the up-and-down and the lateral. This seems a pretty clear intimation that he is to eat both flesh and vegetables.

The teeth aid us in articulating words, and they give a roundness and symmetry to the lower part of the face. When well formed, and kept in good condition, they add much to the beauty of the face, and their decay is an irreparable loss. Their proper care and treatment are spoken of in another place.

The Digestive Organs.

THE alimentary organs are the mouth, the teeth, the salivary glands, the pharynx, the gullet (oesophagus), stomach, bowels (intestines), chyle vessels (lacteals), thoracic duct, liver and sweetbread (pancreas).

The preparatory process of digestion, the mastication of food, takes place in the mouth, where the food is mixed with saliva, a secretion of the salivary glands. Of these glands there are six, three on each side.

The Parotid Gland lies in front of the external ear. It has a duct opening into the mouth opposite the second molar tooth of the upper jaw. This is the gland that swells in the disease called mumps. Hence the disease is also called *parotitis*.

The Submaxillary Gland is inclosed within the lower jaw, in front of its angle. Its duct opens into the mouth by the side of the bridle of the tongue (frænum linguæ).

On each side of this string or bridle, and under the mucous membrane of the floor of the mouth, lies the *sublingual gland*, which pours its saliva into the mouth, through seven or eight small ducts.

A disease called the *frog* consists in the swelling of this gland. Fig. 28: 1, the parotid gland; 2, its duct; 3, the submaxillary; 4, its duct; 5, the sublingual.



FIG. 28.

4, 4, 4, muscles of pharynx; 5, muscles of the cheek; 6, the muscle which surrounds the mouth; 7, the muscle forming the floor of the mouth.

The Gullet or *œsophagus* is a long tube, descending behind the windpipe, the lungs, and the heart, through the diaphragm into the stomach. It is composed of two membranes laid together, like two pieces of cloth. The inner one is mucous, the outer muscular. The two sets of fibres composing the muscular coat are arranged circularly and longitudinally (Fig. 25).

The Stomach lies in the upper part of the belly, to the left, and directly under the diaphragm. It has an upper opening, where the stomach-pipe enters it, called the *cardiac orifice*. This is the larger end of the stomach, and lies on the left side; the smaller end connects with the upper bowel, at which point it has an opening called the *pyloric orifice*. In addition to mucous and muscular coats, similar to those which compose the œsophagus, the stomach has still another over both, a *serous* coat, very strong and tough, to give this working organ additional endurance. Within, it has many glands to secrete the gastric juice.

The Intestines, or *alimentary tube*, or *bowels*, are divided into the *small* and *large* intestines.

The small intestine has a length of about twenty-five feet, and is divided into three parts, — the *duodenum*, the *jejunum*, and the *ileum*.

Of these three divisions, the *duodenum* is the largest, and is about



FIG. 29.

a foot in length. It begins at the pyloric orifice of the stomach, and passes backward to the under surface of the liver, whence it drops down perpendicularly in front of the right kidney, and passes across the belly behind the colon, and ends in the *jejunum*.

The Jejunum continues the above, and terminates in the *ileum*.

The Ileum is a continuation of the *jejunum*, and opens, at an obtuse angle, near the haunch bone, into the *colon*. A valve is located here, to prevent the backward passage of substances from the colon into the ileum.

At this point the large intestines begin, and here is situated the *cæcum*, a blind pouch, or cul-de-sac, attached to which is the *appendix vermiformis*, a worm-shaped tube, of the size of a goose-quill, and from one to six inches long.

The Colon, or large intestine, is divided into the *ascending colon*, the *transverse colon*, and the *descending colon*.

The Ascending Colon rises from the right haunch-bone to the under surface of the liver, whence it bends inward, and crosses the upper part of the belly, below the liver and stomach, to the left side. This portion which crosses over is the *transverse colon*. From this point, on the left side, it turns down to the left haunch, and has the name of the *descending colon*. Here it makes a curve like the letter S, which is called the *sigmoid flexure*.

The Rectum is the lower portion of the large intestine, terminating at the anus.

The Lacteals are small vessels which begin in the villi, upon the mucous membrane of the small bowels. From here they pass between membranes of the *mesentery* to small glands, from which larger vessels run to another collection of glands; and after passing, for a space, from one collection of glands to another, at each stage of their progress increased in size and diminished in number, the lacteals pour their contents into the *thoracic duct*. This having passed up through the diaphragm, out of the belly, makes a sudden turn downward and forward, and empties its burden into a large vein which ends in the right heart. Fig. 30: 1, is the bowel; 2, 3, 4, the mesenteric glands through which the lacteals pass; 5, the thoracic duct; 7, the spinal column; 8, the diaphragm.

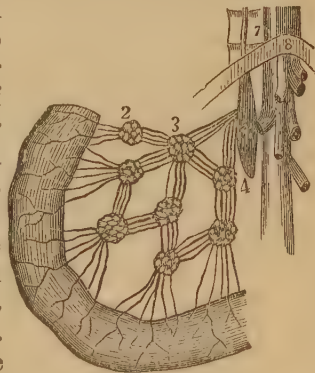


FIG. 30.

By the help of a magnifying glass, an infinite number of these small vessels may be seen starting from the rough, shaggy internal coat of the bowel.

The *mesentery* is a thick sheet of membrane, formed of several folds of the peritoneum, and spread out from the vertebræ like a fan. The bowels are attached to its edge, and are held by it in their place, and at the same time have free motion. Between its layers are a great number of glands, which sometimes become diseased and swollen in childhood, and prevent the chyle from passing along to the thoracic duct. Thus affected, children are not nourished, and waste away with a disease sometimes called mesenteric consumption.

The Liver is a large gland, lying under the short ribs on the right side, below the diaphragm. It is convex on the upper surface and



FIG. 31.

concave on the under, and is composed of several lobes. Its office is to secrete bile. It weighs about four pounds, being the largest organ in the body. Fig. 31 represents the liver: 1, being the right lobe; 2, left lobe; 3, 4, smaller lobes; 10, gall-bladder; 17, the notch into which the spinal column is fitted.

The Gall-Bladder lies on the under side of the liver, and receives, it is supposed, the surplus bile, which is reserved for special occasions. It opens into the gall-duct, which carries the bile along, and pours it into the duodenum.

The Pancreas, Fig. 32, is a long, flat gland, something like the salivary glands. It lies transversely across the back wall of the abdomen, behind the stomach. It secretes a colorless, alkaline fluid called the *pancreatic juice*, the office of which is to emulsify the different classes of food, so that the lacteals can absorb it. This fluid is carried by a duct, and poured into the duodenum just where the bile-duct enters.

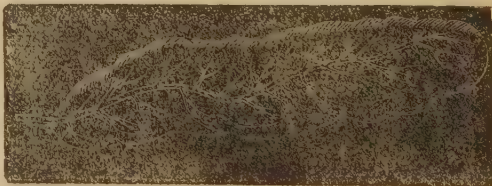


FIG. 32.

The Spleen has an oblong, flattened form. It lies on the left side, just under the diaphragm, and close to the stomach and pancreas. It is supposed to be a reservoir for holding the surplus blood of the liver. It was thought by the ancients to be the seat of melancholy. The blood in passing through it loses a portion of its red globules.

The Omentum or *caul* is a doubling and extension of the peritoneum. It is a kind of fatty body, which lies upon the surface of the

bowels and is attached to the stomach. Its use seems to be to lubricate the bowels, and especially to protect and keep them warm. Hence it is often called the *apron*.

The Urinary System.

THE organs of this system are devoted to separating the urine from the blood, and carrying it out of the body. These organs are the *kidneys*, the *ureters*, the *bladder*, and the *urethra*.

The Kidneys lie one on each side of the backbone, in the lumbar region, behind the peritoneum. They are four or five inches long, and two and a half broad. They are in shape like the kidney-bean, and weigh about half a pound each. In the centre there is a bag called the pelvis, which tapers like a funnel, and unites with the ureter which conveys the urine to the bladder. The texture of the kidney is dense, presenting in its interior two structures, an external or cortical, and an internal or medullary. The cortical portion has the blood-vessels, the medullary is composed of tubes which carry away the urine.

The Ureters are membranous tubes of the size of a goose-quill, and eighteen inches long, which run down the back wall of the abdomen, behind the peritoneum, to the bladder, into each side of which they empty their contents.

The Bladder is located in the pelvis, in front of the *rectum*. It is composed of three coats; the external is serous, the middle muscular, and the internal mucous. The external coat is strong and fibrous; the internal is drawn into wrinkles, which makes it thick and shaggy; it secretes a mucus which prevents it from being injured by the corrosiveness of the urine. The urine is retained in the bladder by means of a circular muscle, called a *sphincter*, which draws the mouth of the organ together. When the quantity of urine is so increased as to give some uneasiness or pain, this muscle, by a sort of instinct, relaxes and lets it out.

The bladder is attached to the rectum, to the hip-bones, to the peritoneum, and to the navel, by several ligaments. In the female the bladder has the womb between it and the rectum.

This organ is wisely provided as a receptacle for the urine; which, without it, would produce a great inconvenience by being constantly dribbling away.

The Urethra is a membranous canal which leads from the neck of the bladder. It is composed of two layers, a mucous and an elastic fibrous. Through this channel, which is curved in its course, the urine passes out of the body.

The Respiratory Organs.

THESE organs consist of the *windpipe* (trachea); *divisions and subdivisions of the windpipe* (bronchia); *air-cells*; and the *lungs or lights*.

The Windpipe (trachea) extends from the *larynx*—the seat of the voice—to the third dorsal vertebra, where it divides into two tubes, called bronchia. It runs down the front part of the throat, with the œsophagus behind and between it and the spinal column. It is composed mainly of rings of cartilage, one above another.

The Bronchial Tubes are, at the division of the windpipe, two in number, but they divide and subdivide until they become very numerous.

The Air-Cells or Vesicles are small, bladder-like expansions at the ends of the tubes. They are elastic and swell out when the air passes in.

The Lungs fill the greater part of the chest, the heart being the only other organ which occupies much space in the cavity. The size of these organs is large or small, according to the capacity of the chest. Each lung—for there are two—is a kind of cone, with its base resting upon the diaphragm, and its apex behind the collar-bone. They are concave on the bottom, to fit the diaphragm, which is convex on its upper side.

The right and left lungs are separated from each other by a partition called the *mediastinum*, formed by two portions of the pleura, a smooth serous membrane coming off from the spine and closely enveloping each lung; the heart, covered by the pericardium, lies in the centre, between them. The right lung is divided into three lobes; the left into two.

Each lobe of the lungs is divided into a great many *lobules*, which are connected by cellular tissue. These lobules are again divided into very fine air-cells. Besides these, the substance of the lungs is composed likewise of blood-vessels and lymphatics, and is well supplied with nerves.

In the foetal state, before the lungs have been filled with air, they are solid and heavy, something like other flesh, but after all their cells have been filled with air, and breathing has been established, they are exceedingly light and spongy, and float upon water.

In cases where infanticide is suspected, and where it is desirable to know whether the child was *still-born*, or born alive and killed afterwards, the specific gravity of the lungs, compared with water, will often settle the question.

The Organs of Circulation.

THE food having been digested, changed to chyle, absorbed by the lacteals, carried to the veins, poured into the right heart, sent up to the lungs, and prepared for nourishing the body, will still be useless, if not distributed to every part of the system. The organs for effecting this distribution are the *heart*, the *arteries*, the *veins*, and the *capillaries*.

The Heart is placed obliquely in the chest, with one lung on each side, and is enclosed between the two folds of the mediastinum. Its form is something like a cone. Its base is turned upward and backward in the direction of the right shoulder; the apex forward and to the left, occupying the space between the fifth and sixth ribs, about three inches from the breast-bone. It is surrounded by a membranous case or sac, called the *pericardium*.

The heart is a muscular body, and has its fibres so interwoven that it is endowed with great strength. It is a double organ, having two sides, a right and a left, which are divided from each other by a muscular partition, called a *septum*. The right heart sends the blood to the lungs; the left heart distributes it to the general system. Each side is divided into two compartments, an auricle and a ventricle.

The Auricles have thinner walls than the ventricles, being only reservoirs to hold the blood until the *ventricles* force it along to other parts.

The Ventricles have within them fleshy columns, called *columnæ carneæ*. The walls of the left ventricle are thicker than those of the right, being required to contract with more force. Each of the four cavities will contain from one and a half to two ounces of blood.

The Tricuspid valves are situated between the auricle and ventricle on the right side, and consist of three folds of a thin, triangular membrane. The *mitral* valves occupy the same position on the left side. Small white cords, called *chordæ tendinæ*, pass from the floating edge of these to the *columnæ carneæ*, to prevent the backward pressure of the blood from carrying the valves into the auricles.

The *pulmonary artery* is the outlet of the right ventricle; the larger artery, called *aorta*, of the left ventricle. At the opening of these arteries are membranous folds, called *semilunar valves*. Fig. 33 gives a fine view of the heart: 1, is the right auricle; 2, the left auricle; 3, the right ventricle; 4, the left ventricle; 5, 6, 7, 8, 9, 10, the vessels which bring the blood to and carry it away from the heart.

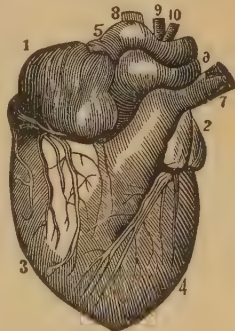


FIG. 33.

The Arteries are the round tubes which carry the red blood from the left side of the heart to every part of the body.

The sides of arteries are stiff and hard, and do not fall together when empty. They may often be seen open in a piece of boiled beef.

The arteries have three coats,—an external, which is cellular, firm and strong; a middle, which is fibrous and elastic; and an internal, which is serous and smooth, being a continuation of the lining of the heart. They are surrounded by a cell vestment called a *sheath*, which separates them from surrounding organs.

The Pulmonary Artery starts from the right ventricle in front of the opening of the aorta, and ascends to the under surface of the aortic arch, where it parts into two branches, sending one to the right, the other to the left lung. Having divided and subdivided to a great extent, they end in the capillary vessels, uniting, joining their mouths, and becoming continuous with the pulmonary veins just where they pass around the air-cells.

The Aorta is the largest artery in the body. It takes a slight turn in the chest, called the *arch of the aorta*, from which are given off the arteries which carry the blood to the head, etc.; thence it descends into the belly along the side of the backbone, and at the bottom of the abdomen it divides into two arteries, called the *iliacs* — one going to each of the lower limbs. The branches the aorta gives off a supply of red blood to every part of the body.

The Veins carry the dark or purple blood. Being made red and vital by meeting atmospheric air in the lungs, and then conveyed to every part of the body in the arteries, the blood loses its redness in the capillaries, and comes back to the heart in the veins, dark and purple, and unfit to support life. The veins are more numerous and nearer the surface than the arteries. They have, likewise, thinner walls, and when empty, they collapse or fall together. They begin in the small capillaries, and running together, they grow larger and larger, and finally form the great trunks which pour the dark blood into the right auricle. The veins are composed of three coats, similar to those of the arteries, with the exception of being thinner and more delicate. These vessels have valves all along their inner surface, to aid in circulating the blood.

The large vein which receives all the dark blood from above, and pours it into the right auricle, is called the *vena cava descendens*; the one which takes it from below, and disposes of it in the same manner, is the *vena cava ascendens*.

The pulmonary veins bring the *red* blood from the lungs to the *left* auricle, and thus are exceptional in their use, — being the only veins which carry red blood.

The Capillaries are the extremely fine network of vessels between the ends of the arteries on the one side, and of the veins on the other.

They inosculate, or join their mouths to the very small arteries at one end, and to the equally small veins at the other. They are the industrious little builders of the human frame. Receiving the blood, red, and full of life, from the terminal extremities of the arteries, they take the living particles out of it, and apply them to the renewing and vitalizing of the body, and then pass it along into the hair-like beginnings of the veins, dark and bereft of vitality, to be carried up for another freight of chyle, and to be again vitalized by being touched in the lungs by the breath of heaven.

In Fig. 34 we have a good ideal illustration of the whole circulation. From the right ventricle of the heart, 2, the dark blood is thrown into the pulmonary artery, 3, and its branches, 4, 4, carry it to both lungs. In the capillary vessels, 6, 6, the blood comes in contact with the air, and becomes red and vitalized. Thence it is returned to the left auricle of the heart, 9, by the veins, 7, 8. Thence it passes into the left ventricle, 10. A forcible contraction of this sends it forward into the aorta, 11. Its branches, 12, 13, 13, distribute it to all parts of the body. The arteries terminate in the capillaries, 14, 14. Here the blood loses its redness, and goes back to the right auricle, 1, by the vena cava descendens, 15, and the vena cava ascendens, 16. The tricuspid valves, 17, prevent the reflow of the blood from the right ventricle to the right auricle. The semilunar valves, 18, prevent the blood from passing back from the pulmonary artery to the right ventricle. The mitral valves, 19, prevent its being forced back from the left ventricle to the left auricle. The semilunar valves, 20, prevent the backward flow from the aorta to the left ventricle.

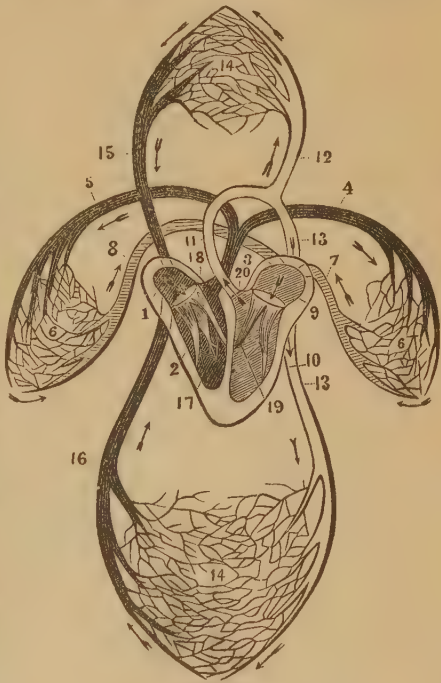


FIG. 34.

By a careful examination of this diagram, with these explanations, the reader may understand the circulation very well.

The passage of the blood from the right heart, through the lungs, and back to the left heart, is called the *lesser*, or *pulmonic circulation*; its passage from the left heart through all parts of the body, and back to the right heart, is the *greater* or *systematic circulation*.

The Absorbent Vessels.

THE vessels which absorb the chyle from the small intestines, and convey it onward towards the blood, are the *lacteals*. They have been described. The veins are also supposed to have the power of absorption, particularly the small commencements of the veins. These have likewise been described.



FIG. 35.

The Lymphatic vessels resemble the lacteals. They abound in the skin, the mucous membranes, and the lungs. They are very small at their origin, and, like the veins, they increase in size, as they diminish in numbers. Like the veins, too, they travel towards the heart, and their



FIG. 36.



FIG. 37.

contents are poured into it. Their walls are composed of two coats; the external is cellular, and distensible; the internal is folded into valves, like that of the veins.

These vessels, on their way to the heart, pass through soft bodies, called *lymphatic glands*, which bear to them the relation that the *mesenteric glands* do to the

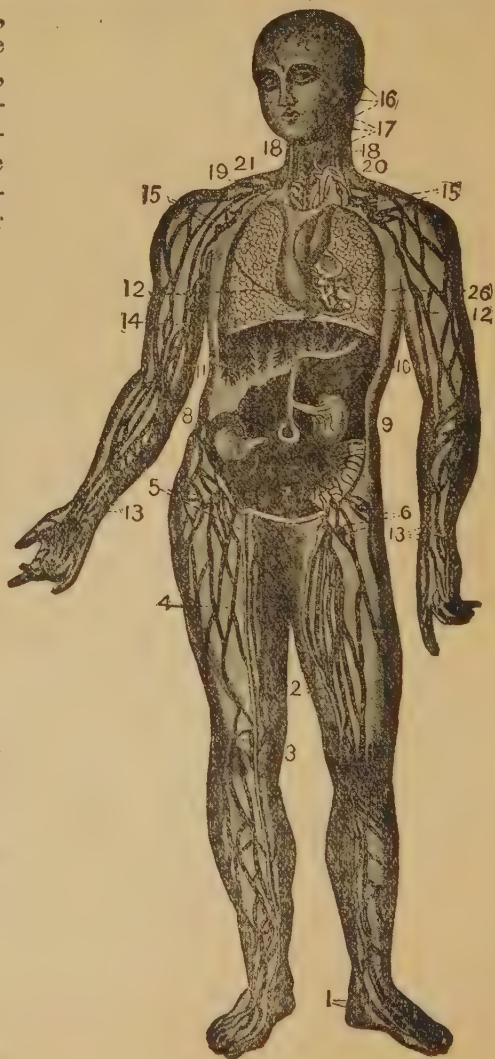


FIG. 38.

lacteals. These glands are a collection of small vessels. The lymphatic glands are most numerous in the neck, chest, abdomen, arm-pits, and groins. They are also found, to some extent, in other parts of the body. Fig. 35 shows a single lymphatic vessel, much magnified; Fig. 36 exhibits the valves along one of the lymphatic trunks; Fig. 37 shows a lymphatic gland with the vessels passing through it.

Fig. 38 represents the lymphatic vessels and glands. 1, 2, 3, 4, 5, 6, show these vessels of the lower limbs; 7, the inguinal glands; 8, the commencement of the thoracic duct, into which the contents of lymphatic are poured; 9, the lymphatics of the kidneys; 10, those of the stomach; 11, those of the liver; 12, 12, those of the lungs; 13, 14, 15, those of the arm; 16, 17, 18, those of the face and neck; 19, 20, the large veins; 21, the thoracic duct; 26, the lymphatics of the heart.

A cold will often cause lymphatic glands to swell. These swellings are called *kernels*. They often swell, also, without the irritation from cold, and become very much and permanently enlarged, particularly in scrofula. In scrofulous subjects they sometimes suppurate and break, forming bad sores upon the neck.

The Organs of Secretion.

THE *exhalants*, the *follicles*, and the *glands* are the *organs of secretion*.

The Exhalants are the sweat-glands. These have external terminations upon the skin, thus communicating with the air, and internal terminations upon the surfaces of organs not having an outward exposure.

The Follicles are small sacs, located in the true skin and mucous membranes. The pores of the skin are the mouths or outlets of these little bags. Veins and organic nerves are sent to these vessels.

Glands are soft organs, having a variety of structure, and performing many kinds of secretion. A gland is made up of several lobules, united in one mass, and each of these lobules has a small duct, communicating with a main duct which forms the outlet. Fig. 39 shows a gland; 2, the small ducts spread through its body, and running together; 1, the large duct, through which the secreted substance is carried away.

The mesenteric and lymphatic glands merely modify the fluids which pass through them; others secrete from the blood either fluids to be used in the body, or such as are to be cast away.



FIG. 39.

The Vocal Organs.

No sounds touch the heart like those of the human voice, for no mechanic, however scientific and skilful, has ever been able to make an instrument which could produce sounds as beautiful, tones as varied, a timbre as melodious, and inflexions as manifold and agreeable. It has been compared to wind, reed and stringed instruments. In touching expression, it is most resembled by the concert-horn, the bassoon, and the hautboy.

Vocal sounds, past all question, are produced in the *larynx*, but these sounds are *grouped*, or formed into articulate speech, by the pharynx, the nasal cavities, the tongue, the teeth, etc.

The Larynx is a kind of cavity or tube at the top of the windpipe, formed by the union of five cartilages, namely, the *thyroid*, the *cricoid*, the two *arytenoid*, and the *epiglottis*. Ligaments bind these together, and muscles move them.

The Thyroid Cartilage is composed of two parts, and has a connection with the bone of the tongue above, and with the cricoid cartilage below.

The Cricoid Cartilage is shaped like a ring, and hence its Greek name. It is narrowest in front, and broadest behind. It connects



FIG. 40.

with the thyroid cartilage above, and with the first ring of the trachea below. Fig. 40 gives a side view of the cartilages of the larynx: 1, bone at the base of the tongue (os hyoides); 2, the ligament connecting hyoid bone and the thyroid cartilage; 3, the front of the thyroid cartilage; 4, the thyroid cartilage; 6, the cricoid cartilage; 7, the windpipe.



FIG. 41.

Fig. 41 is a back view of the cartilages and ligaments of the larynx: 1, is the back surface of the epiglottis; 3, 3, the os hyoides; 4, 4, the lateral ligaments connecting the os hyoides and the thyroid cartilage; 5, 5, the back face of the thyroid cartilage; 6, 6, the arytenoid cartilages; 7, the cricoid cartilage; 8, the first ring of the windpipe.

The Arytenoid Cartilages are upon the back part of the cricoid, and are connected with the thyroid cartilage by the vocal cords.

The Epiglottis is a fibro-cartilaginous lid, shaped like a leaf, which covers the upper opening of the larynx. It is connected by a carti-

lage to the bone of the tongue (*os hyoides*) and to the thyroid cartilage. Breathing opens and shuts it; and in swallowing, it closes down upon the top of the larynx, to prevent food and drink from passing down the windpipe.

The Vocal Cords are two ligaments, formed of elastic and parallel fibres, enclosed in a fold of mucous membrane. They are about two lines in width, and inserted behind into the anterior projection of the arytenoid cartilages, and passing forward, are fixed to the anterior angle of the thyroid. There are four ligaments crossing the larynx, two superior and two inferior, — the latter being called vocal cords. The interval between them is the glottis. The ligaments themselves are sometimes called the *lips of the glottis*. The depression between the superior and inferior ligaments is the *ventricle* of the larynx.

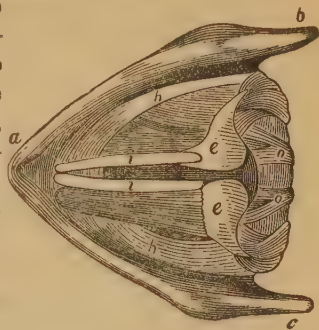


FIG. 42.

Fig. 42 represents a view of the larynx from above: *a, b, c*, the thyroid cartilage, enclosing the ring of the cricoid; *h, h, e, e*, the arytenoid cartilages connected by the transverse arytenoid muscle; *i, i*, the vocal cords; *o, o*, the crico-arytenoid ligaments.

The muscles which are attached to the cartilages have the power of pulling them about so as to change in various ways the shape of the laryngeal cavity; to enlarge or diminish the size of the glottis; and to relax or tighten the vocal cords. By these means, and some others, the sounds of the voice receive their various modifications. Tightening the cords, for example, raises the pitch.

The Skin.

THE skin is a membrane composed of two layers, covering the entire person. The outer layer is the *scarf-skin* or *cuticle*; the inner is the *true skin* or *cutis* or *corium*. These layers differ in their structure and uses.

The Scarf-Skin, called also *cuticle* and *epidermis*, is a thin membrane, partially transparent, like a thin shaving of horn. Having no blood-vessels or nerves, and consequently no feeling, it appears to be a simple covering to protect the true skin from injury by external agents. It is thickest on those parts most exposed to friction.

The scarf-skin is the production of the true skin, — an exudation from it in the shape of a fluid which is spread out as a thin layer, and *dries* up into flattened scales. The cuticle is composed chiefly of these scales, and is constantly being rubbed off as scurf, while new layers are forming underneath.

The lower, softer layer of the scarf-skin, called the *malpighian* layer, or *rete mucosum*, is the seat of *color*. In this part the cells contain a pigment incorporated with the elementary granules, which gives to the various races their several shades of color. The depth of hue is dependent entirely on the amount of this coloring matter.

The True Skin, which is called *cutis*, *derma* or *corium*, is a kind of web, woven of small fibres collected into strands. In the upper portion, the web is fine and firm, but grows coarser below. Connected

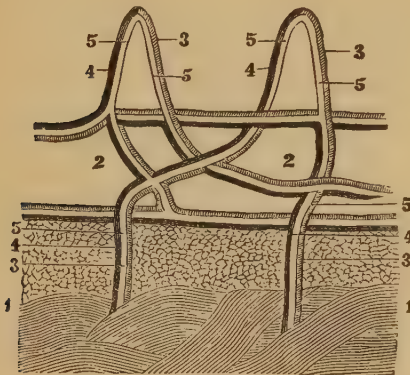


FIG. 43.

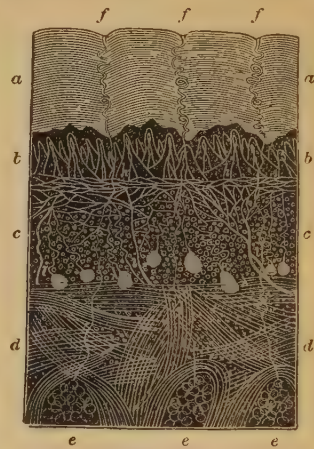


FIG. 44.

with its under surface is a fibrous web in which the fat is deposited. Upon its upper surface is the sensitive or papillary layer, composed of blood-vessels and nerves, doubled into loops, which give little prominences called papillæ. Fig. 43 gives an ideal view of these elevations, composed as they are, of a nerve, an artery, and a vein, lying side by side; 1, 1, represent the true skin; 2, 2, the papillary layer; 3, 3, the arteries; 4, 4, the veins; and 5, 5, the nerves of the papillæ.



FIG. 45.

The arteries, veins, and nerves are spread over the true skin in great numbers,—so profusely, that it is impossible to push the point of the finest needle into it, without piercing a blood-vessel and a nerve.

Fig. 44 gives a view of the skin: *a, a*, the cuticle; *b, b*, the colored layer of the cuticle; *c, c, d, d*, the true skin; *e, e, e*, fat-cells; *f, f, f*, sweat-tubes.

The *lymphatics* are very numerous in the skin, besides which there are *oil-glands* and *tubes*, and *sweat-glands* and *tubes*.

The Oil-Glands are imbedded in the skin, and communicate with the surface by small tubes. They are most abundant on the face,

nose and ears. Fig. 45 shows an oil-gland, — *a*, being the gland, *b*, the tube, and *c*, its mouth.

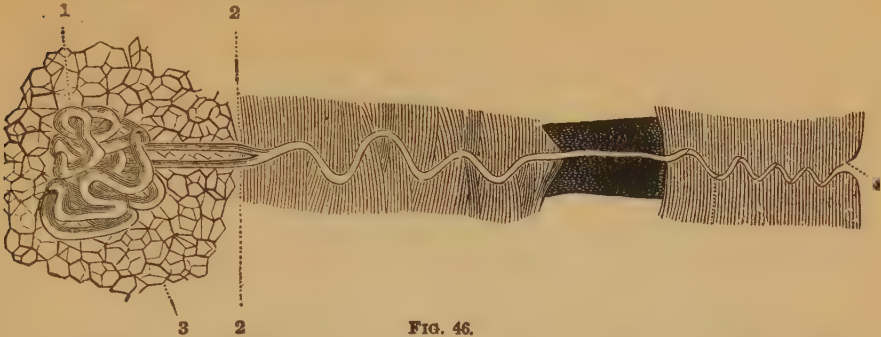


FIG. 46.

The Sweat-Apparatus consists of small tubes which pass down through the true skin, and terminate in the meshes at the bottom, where it coils upon itself into a kind of bundle, called the *perspiratory gland*. Fig. 46 gives one of these tubes, with the gland, magnified forty diameters: 1, being the coiled tube or gland; 2, 2, the two excretory ducts from the gland. These uniting form one spiral tube, which opens at 4, which is the surface of the cuticle; 3, are the fat-cells.

The hair and the nails are appendages of the skin.

The Nervous System.

The Nervous System consists of the *brain* and *spinal cord*, connected with each other, and called the *cerebro-spinal axis*; the *cranial nerves*; the *spinal nerves* and the *sympathetic nerve*.

The Brain is that mass of nervous matter lodged within the skull-bones. It is made up of three principal parts, — the *cerebrum*, the *cerebellum*, and the *medulla oblongata*. These are nicely covered and protected by three membranes, the *dura mater*, the *arachnoid*, and the *pia mater*.

Fig. 47 shows a considerable portion of the brain, — the skull-bones and membranes being removed. The scalp turned down is represented by *A, A*; *E, E, E*, show the cut edge of the bones; *C*, is the *dura mater*, drawn up with a hook; *F*, the convolutions of the brain.



FIG. 47.

The Cerebrum is the upper and larger portion of the brain, and is

divided into two hemispheres by a fissure. A portion of the *dura mater* dips into this cleft, and from its resemblance to a sickle, is called the *falx cerebri*. The design of this seems to be to support each half of the brain, and to prevent it from pressing upon the other half when the head reclines to one side.

The undulating surface of the cerebrum is produced by what are called *convolutions*. The lower surface of this organ is divided into three lobes, — the anterior, the middle, and the posterior.

The surface of the cerebrum is of a gray color, called *cortical*, or *cineritious*; the central portion is white and fibrous, and is called *medullary*.

The Cerebellum is about one-sixth the size of the cerebrum. It lies just under the posterior lobe of the cerebrum, and is separated from it by an extension of the *dura mater*, called the *tentorium*. It is composed of white and gray matter; when the former is cut into, there is presented the appearance of the trunk and branches of a tree, called *arbor vitæ*.

The Medulla Oblongata is the top of the spinal cord; but being within the enclosure of the skull, it passes for a portion of the brain. It consists of three pairs of bodies, united so as to form a bulb.

The Dura Mater is a strong, fibrous membrane which lines the skull and spinal column, and sends processes inward to support the brain, and forward, as sheaths for the nerves which go out from the brain and spinal cord.

The Arachnoid is a serous membrane, and like all other serous membranes, is a closed sac. It is reflected upon the inner surface of the *dura mater*.

The Pia Mater is a vascular membrane, and lies next to and invests the whole surface of the brain, — dipping into its convolutions. It furnishes nutriment to the brain.



FIG. 48.

The Cranial Nerves which go out from the brain are in twelve pairs. In reading a description of them, let the reader keep his eye on Fig. 48.

The First Pair, olfactory (6), passes through several small openings in the ethmoid bone, and is distributed to the mucous membrane which lines the nose. Destroy this, and the sense of smell is gone.

The Second Pair, optic nerve (7), passes through the base of the skull, and enters the cavity of the eye where it is expanded upon the retina. It is a disease of this nerve which occasions a gradual loss of sight, called *amaurosis*.

The Third Pair, *motores oculorum* (9), passes through the sphenoid bone to the muscles of the eye.

The Fourth Pair, *patheticus* (10), passes to the superior oblique muscle of the eye.

The Fifth Pair, trifacial nerve (11), like the spinal nerves, has two roots, and divides into three branches, one going to the eye, forehead, and nose, called the *ophthalmic* branch; another going to the eye, the teeth of the upper jaw, etc., called the *superior maxillary*; and the third going to the ear, the tongue, and the teeth of the lower jaw, and called the *inferior maxillary*. It is a painful condition of the branches of the fifth pair which constitutes the terrible neuralgic affection called *tic-douloureux*.

The Sixth Pair, *abducentes* (12), passes the opening by which the carotid artery enters the cavity of the skull, and goes to the external straight muscle of the eye.

The Seventh Pair, *portio mollis* (13), is distributed upon the internal ear.

The Eighth Pair, facial nerve (14), is distributed over the face. It sends nervous filaments to the muscles.

The Ninth Pair, *glosso-pharyngeal* nerve (14), passes through the same opening with the jugular vein, and is distributed upon the mucous membrane of the tongue and throat.

The Tenth Pair, *pneumogastric* nerve (15), sends its branches to the pharynx, larynx, gullet, lungs, spleen, pancreas, liver, stomach, and bowels.

The Eleventh Pair, spinal accessory nerve (16), connects with the ninth and tenth pairs, and is distributed to the muscles of the neck.

The Twelfth Pair, *hypo-glossal* nerve (17), goes to the tongue, and is its motion-producing nerve. It is a nerve of great energy in those who talk much.

The Spinal Cord extends from the medulla oblongata, where it is in connection with the brain, down to the second lumbar vertebra. The upper end of the cord presents a bulbous swelling, or enlargement. Another swelling is found where the nerves are given off which go to the upper extremities; and a third near the end of the cord, where the nerves begin which go to the lower extremities.

Fissures dip into the cord before and behind, and divide it into two lateral parts, which are united by a thin layer of white substance.

These lateral columns are divided by furrows into *anterior*, *lateral*,

and *posterior* columns;—the anterior being supposed to be the *motor* column, the posterior that of *sensation*, and the lateral divided in function between motion and sensation.

The Spinal Nerves, connecting with the cord, are in pairs, of which there are thirty-one. Each pair has two roots,—a *motor* root,

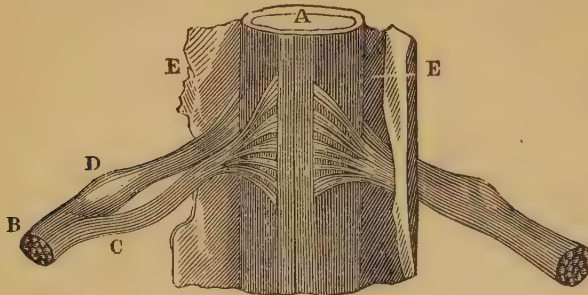


FIG. 49.

C, Fig. 49, arising from the anterior columns of the cord, and a *sensitive* root, *D*, springing from the posterior columns. *A*, is a section of the cord, surrounded by its sheath. *B*, is the spinal nerve, formed by the

union of the motor and sensitive roots. After the union, the nerve, with its motor and its sensitive filaments, divides and subdivides as it passes on, and is distributed to the tissues of the several organs.

The thirty-one pairs of spinal nerves are divided into eight pairs of *cervical*, twelve pairs of *dorsal*, five pairs of *lumbar*, and six pairs of *sacral* nerves.

Fig. 50 gives a view of the brain and spinal cord, with the nerves given off by the latter: 1, 1, being the two hemispheres of the brain; 3, 3, the cerebellum; 4, the olfactory nerve; 5, the optic; 7, the third pair; 8, the pons varolii, so called; 9, the fourth pair; 10, the lower portion of the medulla oblongata; 11, 11, the spinal cord; 12, 12, the spinal nerves; 13, 13, the brachial plexus; 14, 14, the lumbar and sacral plexus.

The Brachial Plexus is formed by the interlacing of the four lower cervical and upper dorsal pairs of nerves. It gives off six nerves, which are distributed to the muscles and skin of the upper extremities.

The Lumbar and Sacral Plexus is formed by the last dorsal and five lumbar nerves, from which nerves go to the muscles and skin of the lower extremities, and the last lumbar and four sacral, from which nerves are sent to the muscles and skin of the hips and lower extremities.

The Sympathetic Nerve consists of a series of *knots* (ganglia), lying along on each side of the spinal column, and forming a knotted chain. There is a knot for each intervertebral space, the neck excepted. These knots are composed of both cineritious and medullary matter.

Each knot is a distinct centre, and gives off branches upward, downward, externally, and internally. All the internal organs are

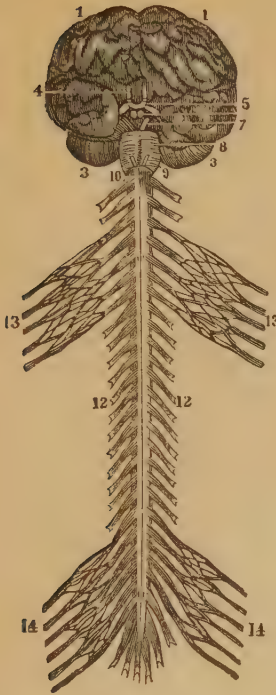


FIG. 50.

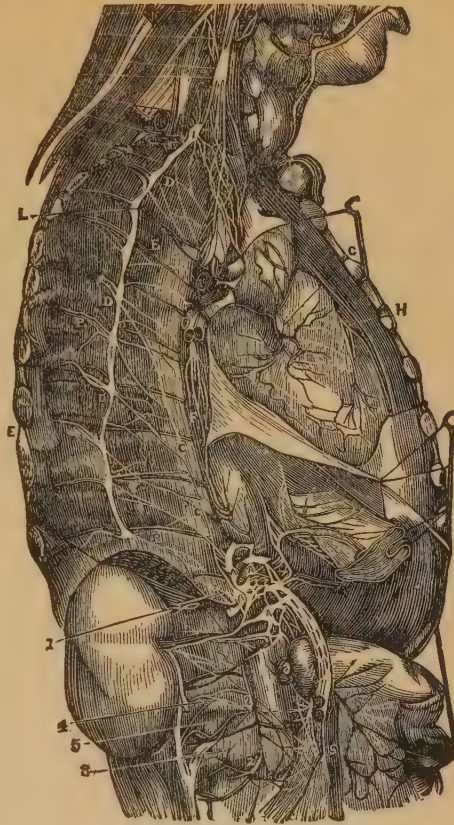


FIG. 51.

supplied with branches from the sympathetic nerve. It is called the nerve of organic life, and is supposed to preside over nutrition, secretion, etc., as the nerves of the brain and cord preside over motion and sensation.

Fig. 51 is a fine representation of the great sympathetic, with its knots, and connections with other nerves. A, A, A, is the semilunar ganglion and solar plexus, lying just under the diaphragm and behind the stomach. Its presence in this region is the reason why a blow upon the pit of the stomach sometimes destroys life. D, D, D, are the thoracic ganglia; E, E, the external and internal branches of the same; G, F, the right and left coronary plexus upon the heart; I, N, Q, the inferior, middle, and superior cervical ganglia; 1, the renal plexus around the



FIG. 52.

kidneys; 2, the lumbar ganglion; 3, the internal branches; 4, the external branches; 5, the aortic plexus.

Fig. 52 represents a plexus, showing how the filaments of one nerve pass to be enclosed in the sheath of another. In this way they change at once the direction of their journey, and their companions upon the way.

The Organs of Sight.

THE organs of vision are the *optic nerve*, the *globe of the eye*, the *muscles of the eye*, and the *organs of protection*.

The **Optic Nerve** begins by two roots at the base of the brain, the fibres from which meet, as they come forward, and some of them cross each other. The two nerves then separate, and enter the back part of the globe of the eyes, and then spread out into a kind of membrane. In Fig. 53: 1, 1, show the globe of the eye; 2, the crossing of the optic nerve; 8, the origin of two pairs of cranial nerves.



FIG. 53.

held in their place by membranes, called *coats*.

The **Coats** are the *sclerotic* and *cornea*; the *choroid*, *iris*, and *ciliary processes*; and the *retina*.

The **Sclerotic Coat** is a fibrous membrane, covering the largest portion of the globe. To this the muscles are attached. It is the part which is called the *white of the eye*. It has a beveled edge in front, into which the cornea is fitted.

The **Cornea** is a transparent layer which projects in front, and forms about one-fifth of the globe. It is shaped like a watch-glass. Its blood-vessels are too small to receive the red particles of blood.

The **Choroid Coat** is a vascular membrane. Its color is brown externally, and black within. It is connected with the sclerotic coat externally, and internally with the retina. It is composed of three layers.

The **Iris** is named from its having a variety of colors in different persons. It is the partition between the anterior and posterior chambers of the eye, and has a circular opening in the centre called the *pupil*. Of its two layers, the fibres of the anterior one are radiating, and dilate the pupil, while those of the other are circular, and cause its contraction.

The Ciliary Processes are a number of folds formed from the internal layer of the choroid coat.

The Retina has three layers. The external is extremely thin; the middle is nervous, being an expansion of the optic nerve; the internal is vascular, and consists of a ramification of minute blood vessels.

The divided edge of their coats may be seen in Fig. 54, namely, the sclerotic, the choroid, and the retina: 2, is the pupil; 3, the iris; 4, the ciliary process; 5, the scolloped border of the retina.



FIG. 54.

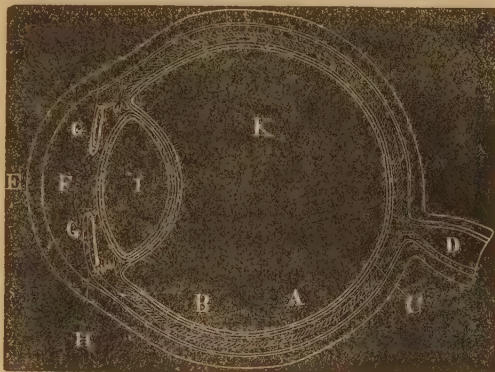


FIG. 55.

The Humors of the Eye are the *aqueous*, the *crystalline*, and the *vitreous*.

The Aqueous or watery humor is situated in the chambers of the eye. It is an albuminous fluid, with an alkaline reaction, and a specific gravity a little greater than distilled water.

The Crystalline Humor is immediately behind the pupil. It is a *lens*, and is convex both on the posterior and the anterior surface.

The Vitreous Humor is also an albuminous fluid something like the aqueous humor, but more dense.

In Fig. 55 we have in E a good view of the cornea fitted into the sclerotic coat; A, is the choroid; B, the pigmentum nigrum, C, the retina; K, the vitreous humor; D, the optic nerve; I, the lens; C, the Iris, painted on the back side with pigment; F, the aqueous humor.

The muscles of the eye, six in number, are attached to the bones of the orbit behind, and to the cornea in front, by their tendons. These tendons give the eye its pearly appearance. In Fig. 56, five of the muscles are indicated by *a, b, c, d, e*; *f*, is the optic nerve.

If the internal muscle be too short, the eye is drawn in towards the nose, and the squinting called "cross-eye" is produced.

The Orbits are bony sockets which enclose the eye. The optic nerve passes through a large hole at the bottom.

The Eyebrows are the projecting arches above, covered with short hair. They prevent the sweat from running down into the eyes, and also shade them from strong light.

The Eyelids are the curtains which rise and fall in front. The smooth membrane which lines them is called the *conjunctiva*. It secretes a fluid which makes the eyelids open and shut easily.

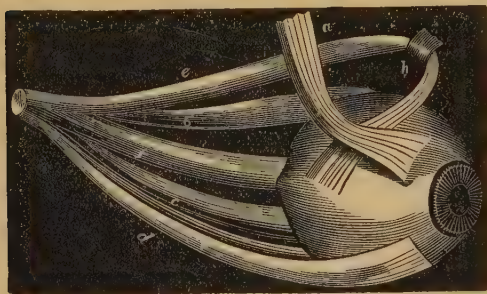


FIG. 56.



FIG. 57.

The Lachrymal Gland is at the upper and outer angle of the orbit. Several small ducts open from it upon the upper eyelid, through which the tears run down upon the conjunctiva.

The Lachrymal Canals begin near the internal angle of the eye, by two small-tear points, which communicate with the sac at the upper part of the nasal duct.

The Nasal Duct is a canal about three-quarters of an inch long, which runs down to the inferior channel of the nose.

Fig. 57 shows these organs: 1, being the lachrymal gland; 2, the ducts leading to the upper eyelid; 3, 3, the tear-points (*puncta lachrymalis*); 4, the nasal sac; 5, the termination of the nasal duct.

The Organs of Hearing.

The External Ear is composed of the pavilion of the ear (the pinna), and the auditory canal (the *meatus auditorius externus*).

The Pinna surrounds the entrance to the auditory canal. It stands out from the head, and is in common language called the ear.

The Meatus Auditorius is a canal about an inch long, partly bony and partly cartilaginous, which goes from the pavilion of the ear to the *drum of the ear*.

The Drum of the Ear (*membrana tympani*) is an oval-shaped thin membrane, inserted into a groove around the auditory canal.

The Tympanum is a cavity within the temporal bone.

The Eustachian Tube is a channel of communication between the tympanum and the upper part of the pharynx. The object of this is to convey air to the drum of the ear, as without air no sound can be produced.

The Labyrinth is a series of chambers through the petrous bone — embracing the *vestibule*, a three-cornered cavity within the tympanum; the *semi-circular canals*, communicating with the vestibule, and the *cochlea*, which makes two and a half turns around an axis, called the



FIG. 58.

turns around an axis, called the *modiolus*.

In Fig. 58, *a*, is the pavilion of the ear; *c*, the auditory canal; *g*, the membrana tympani; *k*, the tympanum; *e*, the bones of the ear; *b*, the semicircular canals; *f*, the cochlea; *h*, the vestibule; *i*, the eustachian tube; *d*, the auditory nerve.

In Fig. 59, we have a view of the labyrinth laid open, and highly magnified: 1, 1, being the cochlea; 2, 3, the channels that wind around the central point (5); 7, 7, the vestibule; 8, the foramen rotundum; 9,



FIG. 59.

the fenestra ovalis; 4, 6, 10, the semicircular canals.

HYGIENE

Physiological Laws of Life and Health

It is absolutely necessary that every person should be conversant
with Hygiene, to understand the laws of health.

PHYSIOLOGICAL LAWS OF LIFE AND HEALTH.—HYGIENE.

Life, the Infancy of Being.

It may be stated as a general truth that man has but just learned to live when he is ready to die. We expend a large portion of our lives in searching out our mistakes, and in striving to undo the mischiefs they have occasioned. This is true in reference both to our moral and our physical life; and I draw from it the conclusion that the present must be only the infancy of our being, and that our blunders and consequent sufferings here will cause us, in the great hereafter, to place a higher value upon knowledge, and to struggle with new fortitude to rid ourselves of every bondage.

A life which has just begun to take shape and symmetry, cannot be permitted, I think, under the rule of a benevolent Creator, to become extinct. We shall certainly be permitted to take up the broken thread of life, and, in the clearer light of the future, with the warning experience of the past, and surrounded by better guards, to try again. In the meantime, while here, the sooner we become acquainted with the laws of life, and the better we obey them, the more we shall enjoy.

The Nervous System.

MAN is brought into connection with the outward world through the senses of feeling, seeing, hearing, etc. These communicate with the brain and mind through the nerves of sensation.

The nervous system is divided into two great central portions, the brain and the spinal cord; and these together are called, by the learned, the *cerebro-spinal centre*. There are numerous pulpy white cords, called nerves, which at one end are connected with this great axis or centre, and from thence run to all parts of the system. A portion of these nerves start from the base of the brain and run to the eye, the ear, the tongue, etc. (Fig. 48); while another, and a larger part spring from the cord which runs through the backbone, and are distributed over the body and the lower extremities (Figs. 50 and 60). One portion of these cords produce feeling; another part, motion. The former we call sensitive; the latter, motor. Both kinds are widely distributed over the body. Those which spring from the spinal cord have two roots, one uniting with the *back*, the

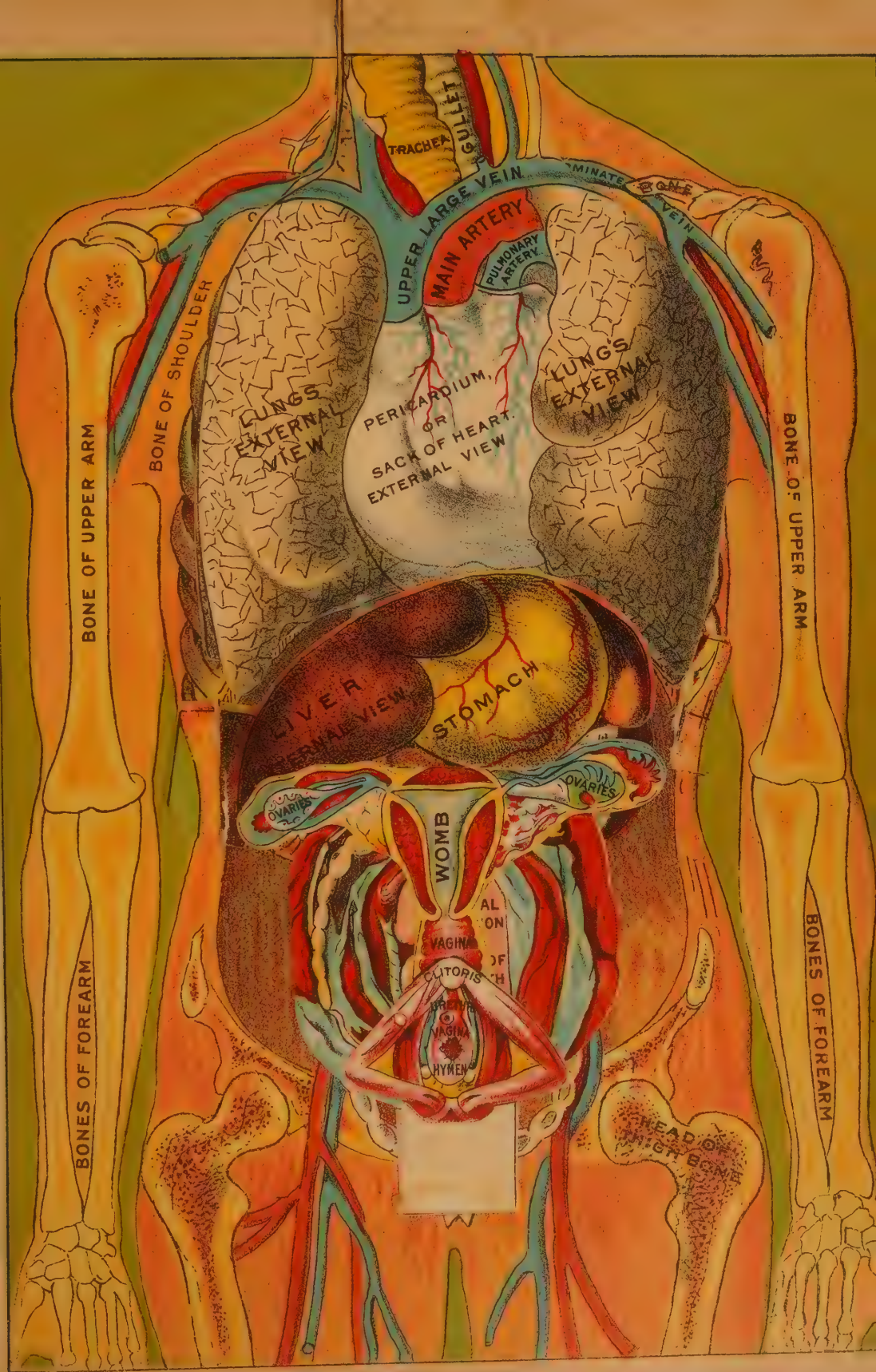
other with the *front* part of the cord. Cut off the back root, and the part to which it is distributed loses its feeling. As we say in common language, it becomes *numb*, though it may *move* as well as before. Cut the front root, which is motion-producing, and the part to which it goes cannot move. It is *palsied*, though it may still feel acutely. The numerous nerves that spring from the spinal column are pretty well represented in Fig. 60.

If the cranial nerves of motion which go to the face be cut, no emotion or passion can be expressed. The features will all be immovable, like statuary. To smile, to laugh, to frown, to give expression to the feeling of pity, or anguish, or love, is alike impossible. And yet a breath of air upon the face will be *felt* as readily as before. Paralysis, or palsy, as it is called, partial or general, is the result of injury upon few or many of these motion-producing nerves. Neuralgia, tic douloureux, etc., arise from some disease, perhaps inflammation, of the nerves of sensation.



FIG. 60

How the Mind gets Knowledge.—Everything the mind knows of the external world, it learns through the organs of sense, which communicate with it through these nerves. Thus, the nerves are acted on by external agents, and then they act on the brain and cause sensations. When the hand is burned the nerves of sensation run with the intelligence to the brain, which, quick as thought, through





the nerves of motion, despatches orders to the muscles to repel the injury.

Comparison. — The arrangement and operation of the nervous system are like those of the electric fire-alarm system of a city. The brain is the intelligent centre, like the central office. The nerves of sensation which carry to the brain, with electric speed, intelligence of what is going on outside, are like the wires which run to the central station from the several boxes. The quick carrying to the brain of any information of injury done to some part of the body, is like sending to the central station from an alarm-box the intelligence of fire in one of the districts. The rapid transmission of orders from the mind to the muscles is like flashing the alarm over the wires to every part of the city. And, finally, the powerful action of the muscles in warding off danger is like the dashing of firemen over the pavements and the energetic playing of the engines.

Sensations.

AN effect produced on the mind through a nerve is called a *sensation*. Hunger is a sensation. It is an effect produced upon the mind through a certain nerve by the condition of the stomach. Thirst, pain, heat, cold, are sensations in a similar sense. Nausea is a sensation produced by some injurious substance acting upon the coats of the stomach.

Strength of Sensation. — Some sensations are much stronger than others; some are very intense. A very strong sensation is called a feeling. It is common to say, "I feel cold," or, "I feel hot." We simply mean by this, that the temperature of the weather makes a very powerful impression upon us.

Kinds of Sensation. — Sensations are either pleasurable or painful. Pleasurable sensations arise from the proper exercise of some healthy part of the body; and they are a suitable reward for any care the mind may take of the corporeal organs.

The sensations arising from a proper amount of exercise are pleasurable. The muscles find a sort of enjoyment in action. He who leads a sedentary life, either from choice or necessity, loses much enjoyment. Hence, there is pleasure in labor; and the working-man, though often pitied by the wealthy, is generally the happiest of men. The eye and the ear, when directed to agreeable sights and sounds, derive the most agreeable sensations from exercise. The air of a beautiful spring-morning gives impressions which none can describe, but which all know to be delightful. These impressions are well fitted to reward us for taking at that season, in the open air, the exercise we so much need.

Blood Pressure.

By this is meant the pressure of the blood on the walls of the artery through which it is flowing. The arteries are a set of elastic tubes; when the left ventricle contracts, the blood is forced into these tubes which expand. At this instant the pressure is at its highest; then the arteries contract and the blood is forced on until the vessels are empty. This is the point of least pressure and is called the *minimal* pressure in contrast to the full artery or the *maximal* pressure; the first representing the resistance offered by the artery, the second representing the heart energy. The *pulse* pressure represents the "head" in the arteries which tends to drive the blood onward. This is scientifically measured by an instrument called the sphygmomanometer, something like a gauge, which registers the highest and lowest pressures and the pulse. The usual maximal pressure for men under 50 is 130 mm., for women 120 mm., women usually having 10-15 mm. lower pressure than men, age and general conditions being the same. The minimal pressure is from 25-40 mm. below maximal in the same individual, the usual limit being 65-110 mm. The following table will show the blood pressure in healthy persons at various ages.

AGE	AVERAGE	HIGH	LOW
Under 2 yrs.	82 Mm. Hg.	90 Mm. Hg.	75 Mm. Hg.
2-10 "	100 " "	110 " "	90 " "
10-15 "	118 " "	140 " "	102 " "
15-30 "	122 " "	141 " "	103 " "
30-40 "	127 " "	143 " "	107 " "
40-50 "	130 " "	146 " "	113 " "
50-60 "	132 " "	149 " "	115 " "
60-65 "	138 " "	153 " "	120 " "

The normal pulse pressure ranges from 25 to 40 mm. A maximal pressure above 150 or below 100 millimeters, and a pulse pressure above 50 or below 20 millimeters, may be regarded as a sign of disease. Of course the blood pressure varies at different times of the day and is affected by position, exercise, excitement, digestion, etc. Alcohol and tobacco in continued or excessive use cause increased blood pressure, as will excesses of various kinds, particularly mental or physical overwork, overeating or following the acute infectious diseases like typhoid and scarlet fever, syphilis and lead-poisoning. In persons past middle life increased blood pressure is frequently associated with great and untiring energy, and it is a common thing to read of cases of sudden death in those who have remarked on their well-being shortly before.

A low blood pressure is indicative particularly of tubercular dangers. A maximal pressure of 150 mm. or lower, with a relatively high minimal pressure, together with a low pulse pressure even in the absence of any other symptom, should lead to careful observation until absolute proof

has been gleaned that the trouble is non-tubercular. The pulse pressure should be carefully watched in low pressure cases; for as the patient improves this pressure approaches nearer the normal, thus proving a valuable guide to prognosis and treatment. General debility from overwork, depressed nervous condition due to exhausted nerve-centres and in conditions where a large amount of fluid is withdrawn from the circulation, as in neurasthenia, shock, hemorrhage, venesection, diarrhœa, etc., are usually accompanied by a fall in the blood pressure.

In valvular heart disease there is little change in the blood pressure, the principal value of the examination being to determine the condition of the heart muscles. Chronic Bright's disease is almost always associated with an increase in pressure. In coma, if the pressure is slow,



How the "Sphygmomanometer" Is Used in Taking Blood Pressure by the Auscultation Method Originated by the Russian Scientist Karotkoff.

the trouble is probably alcoholic or epileptic; if high it is due to apoplexy uræmia or cerebral injury. In diabetes both low and high pressures are noted. In typhoid the pressure begins to fall from the end of the first and continues till the fourth week; as recovery is approached the pressure slowly resumes a normal condition. A marked rise in pressure usually attends perforation of the bowel while serious hemorrhage is attended by a fall. In the advent of kidney disease in scarlet fever the pressure is quickly increased.

The treatment of high blood pressure is directed towards stopping the ingestion of foods, drinks and drugs that would cause intoxication, promote arterial trouble or irritate the kidneys; to lower the pressure;

and to prevent putrefaction in the intestinal canal. Not only the amount of certain foods but the total amount taken must be lessened. Meats and fish should be eaten but once daily if at all and only vegetables which do not cause flatulency. Fruits which agree best may be allowed, but no tea or coffee, alcohol or tobacco. Liquids taken depend on the trouble, as it is not advisable to put any extra strain on the kidneys. Cardiac tonics as strychnin, quinin and salicylates are contra-indicated. Iodides in small doses (2 or 3 grains) 3 times daily are best in cases of arterio-sclerosis. If the patient is over-weighted, the pulse slow, skin dry and there is a tendency to puffing without edema, thyroid gland is indicated in 2-3 grain doses once daily; contra-indicated in those who have nervous irritability. Nitro-glycerine in some form is always advisable.

Need of a Healthy Brain. — In order that we may get correct ideas of the external world, it is necessary that the brain, the nerves, and the organs of sense through which sensations are made upon the mind, should be in a healthy condition. It is evident that if the instruments of sensation be diseased, the sensation cannot be natural, and will make a false report to the mind. It is of the highest importance, therefore, that the brain should be sound.

Improper Intermarriages. — This organ, like every other, may inherit disease from parents. Insanity, which springs from a diseased brain, is often hereditary. When both parents are diseased, the offspring are of course more liable to partake of their defects. Among the wealthy, and particularly among the royal families in Europe, nervous diseases and sterility are very common. This arises, in a great part, from intermarriages among blood relations, — a practice under which any people will degenerate, and finally perish. The wisdom of the Old Testament prohibition of marriage within certain degrees of consanguinity has been established by the observation of philosophers and the experience of mankind. Let those who will transmit to their descendants a sound mind in a sound body, observe the laws of life, and avoid all marriages with blood relations.

Need of a Good Supply of Blood. — For a proper performance of its duties, the brain requires and receives a larger supply of blood than any other part of the system. One-tenth of all the blood goes to this important organ. If the quantity or quality be materially lessened or changed, great disturbance of the brain follows. A large loss of blood occasions dizziness and fainting. If an atmosphere charged with too much carbonic acid gas be breathed, as in a deep well, the blood is not vitalized in the lungs, so as to sustain the brain, and unconsciousness soon follows. If the air be vitiated in any way, or have its oxygen extracted, as in large assemblies, where it is breathed over several times, it becomes unfit to support the brain, and the result is languid feelings, inability to apply the mind, headache, fainting, hysterics, and other nervous manifestations.

Ventilation. — This shows the great necessity of having dwellings, churches, and school-houses well ventilated.

Were a good system of ventilation adopted in all our churches, ministers would seldom preach to sleeping audiences. A congregation sitting in one of our places of public worship, where the air in a single afternoon is as many times used over as the minister's sermons are in a lifetime, can neither hear with attention, nor comprehend with clearness.

In many of our school-houses, the ventilation is quite as bad, and the consequences worse, because they are occupied six hours of the day instead of three, and five days of the week in place of one. In the small school-houses which our children filled to overflowing in former years, in which there was *no* ventilation, unless they happened to be blessed with an old-fashioned chimney and fire-place, the effects upon the nervous system of the children was deplorable. Many of the diseases which afflict the present generation of men and women had their origin in the bad air of those crowded nurseries of education.

Our dwellings were partly ventilated in olden time, when the open fire-place received the "back-log," the "top-stick," the "fore-stick," and other sticks to match; but since we have been warmed by the stove and the furnace we have known little of the luxury of pure air at the domestic hearth.

Need of Exercise for the Brain. — Health requires that the brain should be properly occupied with vigorous thought. The same reasons may be given for this as for the exercise of the muscles. It is governed by the same laws which apply to other parts of the system. Use improves its strength and vigor; idleness causes it to grow feeble. Of course the labor it is put to should be only reasonable in amount, and should not be too long continued at any one time. With the weakening of the brain, the whole bodily forces, and indeed the whole mental and moral character, fall into feebleness and decay. It is a great mistake to suppose that the cultivation and even vigorous use of the mind impairs health and shortens life. Just the opposite is true. Many of the most eminently intellectual men, who have worked their brains hard all their lives, have been distinguished for long life.

Bad Effect of Change in Circumstances. — No class of persons suffer more from nervous diseases and general ill-health than those who, having worked hard in early life, with little or no cultivation of the mind, are suddenly raised to wealth, and immediately drop all exercise, and fall into habits of indolence and luxury. The condition of such persons would be much less pitiable, did they take up books when they lay by the hoe or the broom. But they seldom do this. Many a woman, in early life, has felt the glow of health in every limb, and a thrill of pleasure, too, while scrubbing the floor on her hands

and knees, who has, in subsequent years, reclined in misery upon her damask-covered lounge, and wondered that she could not have the health of other days. Let her cultivate her brain, live temperately, and exercise in the open air, and life may again have real pleasures for her.

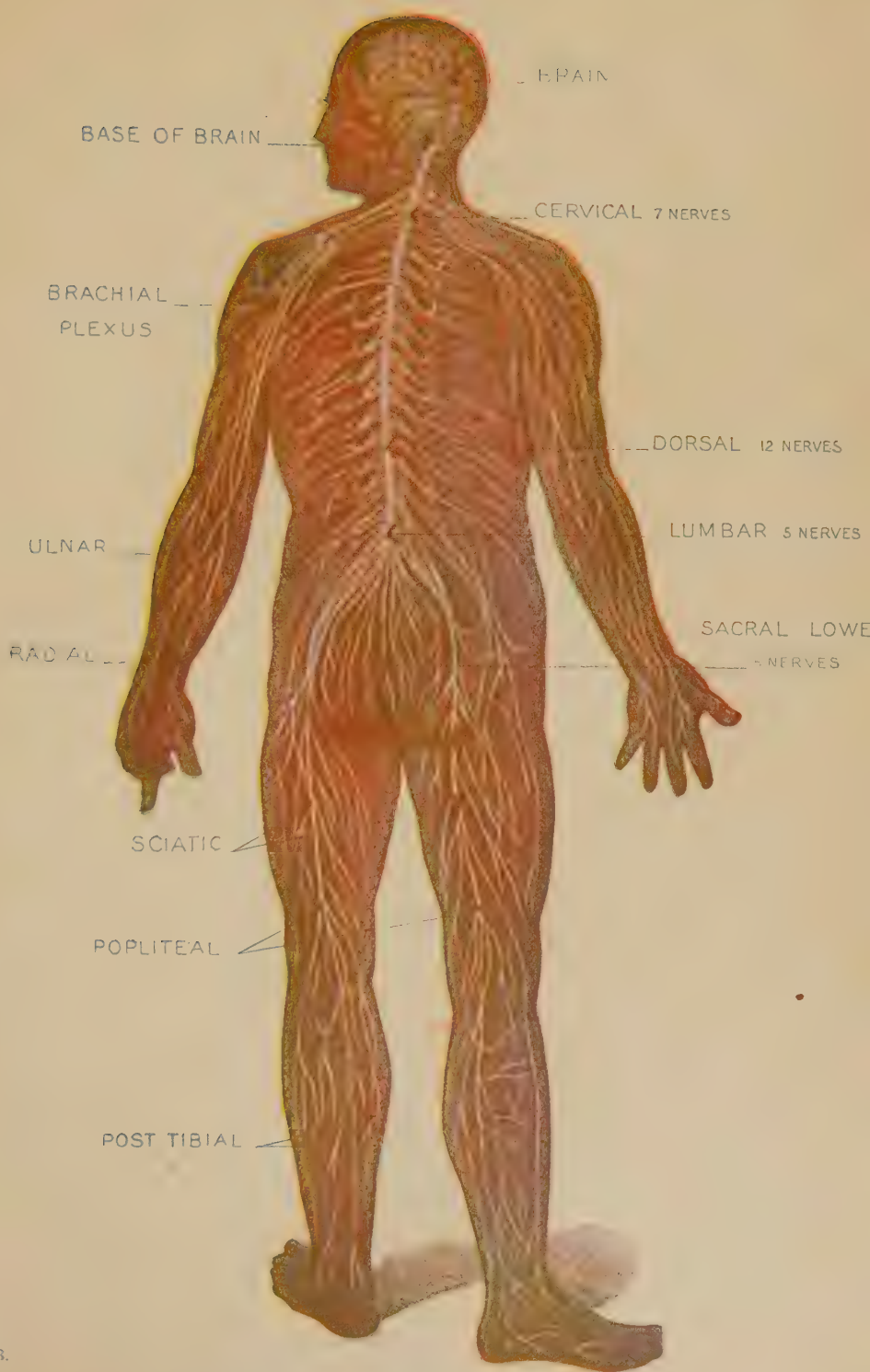
Discretion in Exercising the Brain. — In exercising the brain we must use discretion. We must not sit down in the morning, and ply it with work during the whole day, without rest. This would soon bring upon it disease, or premature decay. It should be worked only until it begins to show symptoms of fatigue. Then it should be permitted to rest; or, what is better, be turned to some new subject, of a lighter, or a different character. This often rests the brain better than to entirely suspend its action.

Overworking the Brain in Childhood. — Great care should be used not to exercise the brain too much in early life. Like other parts of the system, it is tender in childhood, and will not bear prolonged exertion. As a general thing, children are put to school too early, and made to work their brains too hard. Great mischief arises from this source. Children are born with larger brains now than formerly; and it is no uncommon thing to see upon a child of ten years, a head equal in size to that of an adult. Children run to brain. Precocity in development of brain and mind is common. The results of stimulating and hastening the unfolding of such minds are deplorable. In such children, the brain should be the last thing to be cultivated. We do not need to urge its growth. It will come forward fast enough in spite of us. Our chief aim should be to harden and fortify the general constitution, so that the brain which it is required to bear up and sustain may long be its crown and glory.

Yet parents are proud of their precocious children, and often reverse this rule. They do it thoughtlessly, and would be terribly startled could they suddenly look into the future and see the results of their folly. Could they do so, they would see inflammation and softening of the brain, epilepsy, insanity, paralysis, apoplexy, with all the horrors of undescribed and indescribable nervous affections, which, though without a name, have a terrible reality.

Old People's Brains. — Persons in advanced life should be particularly careful not to overwork the brain. In middle life it recovers easily from great fatigue. In the decline of life, its powers of recovery are feeble. A single exhaustion may cause its fatal collapse. Old age should be distinguished for gentleness and moderation. The journey of the down-hill of life should be made by short and easy stages, through regions of diversified beauty.

A Supply of Blood. — Every part of the system, when hard at work, needs and must have a very large supply of pure blood. Without this, it is torpid and inactive. To cause the blood to flow to any particular part, it must be exercised. The lumberman, when



in the forest in extreme cold weather, stamps his feet violently upon the ground, or beats them against a log, and whips his hands around his body, and in this way makes them red and warm with a new supply of blood. The stomach, when it has received a supply of food, begins earnestly to turn it over; and by this exercise, and the stimulus which the food supplies, it invites large quantities of blood to its vessels, and thus increases its power to work. But just in proportion that it draws the vital current to *itself*, and augments its *own* vital force, it diminishes the blood in *other organs*, and for the time being, unfits them for work. The same may be said of the brain and all other working organs.

From this it follows that only one organ, or set of organs, can work effectively at the same time, and that it is improper to put the brain to hard work immediately after a full meal, because the stomach then wants the blood to enable it to digest the food; and if the blood be called off to the brain, digestion will stop. Nor should the stomach be loaded with food directly after long and hard thinking; for the brain will yield up the blood to it only after its own excitement has had time to subside.

Sympathetic Nervous System.

THE object of this system seems to be to bind all parts of the body together, and to combine and harmonize their actions. It takes care that no part of the system acts in such a way as to injure any other part. It exerts a controlling influence over digestion, nutrition, absorption, the circulation, etc. These are natural processes which need to go on while the brain is asleep and cannot attend to them. The nervous system, of which I speak, presides over all those functions which are called involuntary, — so called because no act of the will is needed for their performance. Secretion, absorption, digestion, and the circulation of the blood, all have to go on while we sleep, as well as while we wake. Were an act of the will necessary to their performance, as in walking, eating, conversing, etc., then they would have to cease the moment the brain fell asleep, and death would be the result.

The sympathetic nerves apprise each part of the system of the condition and wants of every other part. When the lungs are inflamed, the stomach seems to be aware of it, and will receive no food, because this would aggravate the disease of the neighboring organs. Well would it be if human beings would exercise a like forbearance, and abstain from those acts of self-gratification which they know will injure their neighbors.

Effects of Nervous Diseases. — Before closing these observations, I wish to add a few words respecting the terrible effects of nervous diseases which characterize the present time.

That they are far more numerous and afflictive than in former

years, must be apparent to the most careless observer. They are nothing more nor less than the price we pay for a high civilization, and especially for our democracy. Among us, every man feels his individuality, and has a motive for thinking and doing his best. Thought and action are here unfettered; and if the race is not to the swift, nor the battle to the strong, every man acts as though he thought it was. The great excitement which the struggle for wealth kindles and inflames, deranges and shatters the nervous system to a shocking degree.

And wealth, when obtained, does its full share to weaken the nerves. It brings with it high living, indolence, loss of energy, dissipation, and a weakening of the whole moral and physical powers. It *need* not do this; but, in most cases, it does.

The result is, that, at least, every other person has some nervous disease, which makes life a misery rather than a blessing. The brain and nerves are too much developed in comparison with the development of the muscles. Half our boys and girls have heads as large as men and women. It is common to see a boy or a girl at ten talking and acting like a man or woman. I do not mean by this, that they imperfectly imitate the actions of older persons. It seems to be natural to them. Their brains are prematurely developed, and their acts and thoughts have the maturity of adult life.

What is Coming? — What will be the result of this state of things, no man can predict. I sometimes think the race will break down; that that which was intended to be its ornament and strength will be its destruction. I hope not. Yet there is danger of it. Nothing can save us but the wisdom to adopt such means as will develop all parts of the system alike. No race of men can stand for many generations such a strain upon the nervous system, unless better means are adopted to counterbalance its evil effects than are now used in the United States. We have got to pause in our swift career, and look after our health, or we shall become a nation of maniacs. No proof is needed of what is here said.

Hopeful Considerations. — It is proper to say, the considerations here presented, terrible as they are, are mitigated in some measure by others of a more hopeful character.

Physiology and the laws of life are now better understood than at any former period. These subjects are getting into our common schools, and are engaging the attention of our youth. Declining health has already made us think more of the means of preserving it, — such as diet, exercise, bathing, travelling, and amusement. To encourage and intensify this hopeful direction of the public mind, I propose to devote a few pages to these subjects.

Food and Digestion.

FROM the earliest dawn of existence to the last moment of life, our bodies are constantly changing. Old particles of matter, when they are worn out, leave their places and are thrown out of the system. Were this the whole of the matter, our bodies would soon waste away, and that would be the end of us. But as fast as the old materials are thrown away, new ones take their places; and it is solely out of our food that these new materials are formed.

In order that the food may be well digested, it must first be broken into small particles in the mouth. The act of chewing it is called mastication. During this act, if it be well performed, a large quantity of spittle, called saliva, flows out of a number of glands, called salivary glands, and mixes with the food, forming with it a soft mass. In this condition, it is thrown backward into the top of the throat, called the pharynx. Here, a little cartilage, called the epiglottis, drops down upon the opening into the top of the windpipe, and prevents its entrance into the breath-passage; and it is pushed along into the gullet, a tube which runs down behind the windpipe and lungs, and which physicians call the œsophagus. Here a succession of muscular bands, circular in shape, contract upon it, one after another, and force it down into the stomach.

It is important that two things should be secured while the food is in the mouth, namely, that it should be reduced to a good degree of fineness by chewing, and that a proper amount of saliva should be mixed with it. If the chewing were not necessary, teeth would not have been given us; and the salivary glands would certainly not have been put in the mouth, if the mixing of water with our food would serve the purposes of digestion as well.

Eating too Rapidly. — Americans have fallen into a pernicious error in eating their food too rapidly. Time is not given to chew it sufficiently to excite a full flow of saliva; and as it cannot be swallowed in a dry state, it is not uncommon to see persons taking a sip of water after every second mouthful, to enable them to force it into the stomach. It is a habit we Americans have of cheating ourselves both of the pleasures and the benefits of eating; for the only real pleasure of eating arises from the flavor of food while retained in the mouth, and the only benefit we can derive comes in consequence of its proper digestion.

The food when received into the stomach is in the same condition as when taken into the mouth, except that it is, or should be, ground fine by the teeth, and well mixed with saliva.

The Gastric Juice. — The stomach, like the mouth, the windpipe, and the gullet, is lined by a mucous membrane. The chief office of this membrane is to secrete, or take out of the blood, a fluid which we call gastric juice, which means stomach juice, from the Greek

name of stomach, γαστήρ (gaster). This fluid has not much smell or taste, and looks like spring water. It has a powerful effect upon food, which, when mixed with it, soon undergoes an important change, which is apparent to the taste, the smell, and the sight. The nature of the gastric juice and how it produces its effect upon food are not certainly known; but it contains two active elements, — a free acid and pepsin, whose function is to dissolve the nitrogenous parts of the food and convert them into albuminose or peptone. The albuminose is absorbed by the coats of the stomach and enters directly into the circulation; while the sugar and fat pass on to the duodenum to be acted upon by the bile, the pancreatic juice, and other secretions of the bowels.

Too Much Cold Water at Meals. — There are some interesting facts connected with the formation of this fluid, of which it is important that every person should be apprised.

Its quantity and quality depend on the amount and healthfulness of the blood which flows to the stomach during the first stage of digestion. It is, therefore, injurious to drink large quantities of very cold water with, or immediately after, our meals; as this will chill the stomach, and repel the blood from its vessels, so that but little of the juice can be formed. Digestion, in such case, must be imperfect.

This Fluid not Secreted Without Limit. — This fluid does not flow into the stomach continuously, but only when we swallow food, and then not as long as we please to eat, but merely till we have taken what the system requires. If, in the amount we take, we go beyond the wants of nature, there will not be fluid enough formed to dissolve it, and the whole will be imperfectly digested, and be a source of injury rather than benefit. This should teach us to be careful that our food be only reasonable in amount.

Not Secreted in Sickness. — When we are sick, the gastric juice is either not formed at all, or only in small quantities. Whatever may be our feelings of lassitude, and however much we may appear to need food, at such times, it is useless to take it, for it cannot be digested, and will only aggravate our disease. If the illness be only slight, the fluid will be formed to some extent, and food may be taken in proportion.

Its Secretion Favored by Cheerfulness. — A cheerful disposition, and a happy, lively frame of mind, are highly favorable to the production of the gastric juice; while melancholy and anger and grief and intense thought of business, at the hour of meals, greatly hinder its natural flow.

This should teach us to go to our meals with light hearts, and to make the family board a place of cheerful conversation, and of a light and joyous play upon the mirthful feelings of all present. Should any of the family circle be in the habit of using vinegar as a condi-

ment, we should never be guilty of compelling them to extract it from our faces. A vinegar face is not easily excused anywhere; at the table it is unpardonable. A single countenance of this description will throw a gloom over a tableful of naturally cheerful persons; and if habitually present at the board, may finally spoil the digestion of half a dozen, and entail dyspepsia upon them for life.

The stomachs of the sick pour out but very little of this fluid, and they can take but a small amount of food. It is cruel to deprive them of the power of digesting that little by treating them harshly, and filling them with gloomy and desponding feelings. I therefore repeat the substance of the advice given on a previous page: Deal gently with the sick.

How all this is Known. — As the stomach is wholly concealed from view, the reader will very naturally ask how it is known that the gastric juice is poured into it in certain states of the mind, etc., and withheld in others. It certainly could not have been so accurately known, had it not been for an accident which opened the living and working stomach to the inspection of Dr. Beaumont, a United States Surgeon. A young man by the name of Alexis St. Martin, a Canadian by birth, but then in the State of Michigan, had a large part of his side torn away, and a hole of considerable size made into his stomach, by the accidental discharge of a gun. To the surprise of his surgeon, St. Martin recovered; and the edges of the wound in the stomach refused to grow together, preferring rather to fasten themselves to the borders of the breach in the side, thus leaving the passage open. A kind of curtain grew down over this, which prevented the food from falling out. Dr. Beaumont, taking advantage of this state of things, instituted a series of valuable experiments, by lifting the curtain, and inserting various articles of food, and witnessing the process of digestion.

Movement of the Stomach. — The presence of food in the stomach causes its muscular coat to contract and throw it about from side to side, mixing it thoroughly with the gastric juice, and reducing it to a pulpy mass, called *chyme*. This, as fast as it is properly prepared, passes through the pylorus into the upper bowel, or *duodenum*, called also the *second stomach*.

Chyme. — A certain witty professor of anatomy and physiology was in the habit of asking his class if they ever saw any chyme; and when they answered, no, as they often did, he called their attention to what is occasionally to be seen in the morning, upon the sidewalks, where drunken men have held themselves up by lamp-posts, and left the contents of their stomachs.

The pylorus, or opening into the bowel, has a very singular and wise instinct, which is worthy of remark. When a piece of food, which has not been digested, attempts to pass into the bowel, the moment it touches the inner surface of this orifice, it is instantly

thrown back by an energetic contraction; though a portion of well-prepared chyme, touching the same opening immediately after, is allowed to pass unchallenged.

Chyle. — The chyme, when it reaches the duodenum, seems to cause the liver to secrete bile, and the pancreas to produce pancreatic juice. These two fluids are conveyed into the upper portion of the second stomach, and there are mixed with the chyme, and cause it to separate into a delicate, white fluid, called *chyle*, and a residuum, which, being worthless, is pushed onward, and thrown out of the body.

Bile in the Stomach. — Most persons suppose that the bile is generally found in the stomach; but this is a mistake. It is thrown up by vomiting, because in that act, the action both of the first and the second stomach is *reversed*, and the bile is forced up from the duodenum, — taking a direction the opposite of its usual course.



FIG. 62.



FIG. 61.

Destination of the Chyle. — The chyle being separated from the dregs, is pushed onward in its course by the worm-like motion of the intestine; and as it passes along, it is gradually sucked up by thousands of very small vessels, whose mouths open upon the inner surface of the bowel. These little vessels are called *lacteals*, from the Latin word *lac*, which means milk, because they drink this white, milky fluid. Fig. 61 shows a section of the small bowel, turned inside out, and covered with the villi, or root-like filaments, closely set upon its surface, for absorbing the chyle, and at the bottom of which the lacteals take their rise.

In these lacteals, and in the mesenteric glands, the chyle is gradually changed, so as to approach nearer and nearer to the nature of the blood; but precisely what the change is, or how it is effected, is not known. Several

learned men have published their theories upon these points, and the writer has opinions upon them; but it is not worth while to trouble the reader with them. It is sufficient to say that the fluid is carried by the lacteals to the thoracic duct, through which it is conveyed into a large vein at the lower part of the neck, where it is poured into the blood, and becomes, after going through the lungs and experiencing another and a vital change, the material out of which our bodies are daily and hourly new-created.

Fig. 62 gives a general idea of the stomach, bowels, etc.: 9, being the stomach; 10, 10, the liver; 1, the gall-bladder; 2, the duct which conveys the bile to 4, which is the duodenum; 3, is the pancreas; 5, the œsophagus; A, the duodenum; B, the bowels; C, the junction of the small intestines with the colon; D, the appendix vermiformis; E, the cœcum; F, the ascending colon; G, the transverse colon; H, the descending colon; I, the sigmoid flexure; J, the rectum.

Nature and Destination of Food.

THE food which man requires for his support and development is of two kinds, inorganic and organic. The first of these embraces certain mineral substances, as common salt, sulphur, phosphorus, iron and lime, either in combination or separate.

These are not generally reckoned as aliments, and yet no human being can live without them. In their absence, the body decays, disintegrates, and perishes. Common salt is composed of muriatic acid and soda. The first is an important ingredient in the gastric juice, and the latter promotes the secretion of bile. Sulphur is found in several of the tissues, particularly in the muscles. Phosphorus, united to fatty matter, is highly honored in forming a portion of the brain and nerves, and is also combined with oxygen and lime to make the earthy or hard part of bones.

Found in Food.—These articles it is not necessary often to introduce into the system in a separate state. They are contained, in larger or smaller proportions, in most articles of food; and man always suffers, as all animals do, from their absence. Common salt is found in the flesh of animals, in milk, and in eggs. It is not very abundant in plants; and we all know how eagerly domestic animals devour it when it is given to them, and how constantly wild cattle resort to the salt springs, which, in the great West, are called “buffalo licks.” Lime exists in nearly all animal and vegetable substances. In wheat flour we get it in combination with phosphoric acid, that is, as phosphate of lime. Lime exists too, in the state of carbonate and sulphate, in all hard water. Iron is found in the yolk of eggs, in milk, in animal flesh, in potatoes, pears, cabbages, mustard and other articles. Sulphur we get in flesh, eggs and milk; and, as sulphate of lime, in spring and river water. Phosphorus is derived from eggs and milk; and flesh, bread, fruits, and husks of grain,

commonly called bran, contain even a larger proportion than we need in our diet.

Organic Food. — The organic elements of man's food, which in bulk embrace almost the whole of it, remain to be considered. In the animal economy they serve two great purposes. A part of the articles which compose them are blood-formers, out of which all the tissues are made, — the other part produces fat, which serves to warm the body by being burned with oxygen. These articles are derived partly from the vegetable and partly from the animal kingdom.

Divided into Four Groups. — For convenience, these articles may be divided into four groups. For the first, sugar stands as a type. We therefore call it the *saccharine* group. It embraces starch, gum, and the fibre of wood. These articles may all be converted into sugar by a simple chemical process. Figure 63 gives a microscopic view of the granules of starch.

The *second group* we call the *oleaginous*. It is composed of oily substances, from whatever source derived, whether the animal or the vegetable world.

The *third group* is the *albuminous*. A good type of it is the white of egg.

The *fourth* is the *gelatinous*, or *jelly* group.



FIG. 63.

First and Second Groups, Supporters of Respiration. — The articles composing the first and second groups are analogous in composition, all containing *oxygen*, *hydrogen*, and *carbon*. They are what Liebig calls supporters of respiration; the meaning of which is, in more comprehensible terms, that they are *supporters of combustion*. They are the *fuel which warms us*. They keep the fires going, from which arises all the heat we have in our bodies. But they are destitute of nitrogen, and, on this account, they are not blood-formers, and cannot be worked into flesh. Hence, man cannot live on them.

The food articles embraced in the third and fourth groups also contain oxygen, hydrogen, and carbon; and to these they add *nitrogen*. This fourth component part, which forms only a small portion of them, gives them, for some reason never explained, the peculiar quality of producing blood and flesh. They are the raw materials, out of which our bodies are reconstructed from day to day.

Feed a man ever so largely upon sugar, starch, gum, and oils, and he will starve as certainly as if he were allowed nothing but water.

Names of Two Great Divisions of Food. — The possession or non-possession of nitrogen, then, is what distinguishes from each other the two great classes of food-articles. Those which contain nitrogen

have been called *nitrogenized*, and those which are destitute of it, *non-nitrogenized* compounds. As nitrogen is often called *azote*, the former class are more frequently named *azotized*; the latter, *non-azotized*.

Let the reader now fix it in his mind that the azotized articles of food produce blood and flesh; the non-azotized, heat; and he will have the key to understand much of what is to be said, and likewise to unlock many of the mysteries of diet.

Nutrition Table.—Taking human milk as the standard, and expressing the amount of nitrogen it contains by 100, the following table shows the relative amount of nitrogen in the principal flesh-producing articles of food, and consequently their power of forming the tissues :—

VEGETABLE.

Rice	81	Potatoes	84
Rye	106	Turnips	106
Corn	125	Carrots	150
Barley	125	Peas	239
Oats	138	Beans	320
Wheat	144		

ANIMAL.

Human Milk	100	White of Egg	845
Cows' Milk	237	Herring	910
Oyster	305	Haddock	816
Yolk of Eggs	305	Pigeon	756
Cheese	331-447	Lamb	833
Eel	428	Mutton	852
Pork-Ham	807	Veal	911
Salmon	610	Beef	942

Other Standards of Value.—We must not infer that those articles which have most nitrogen are necessarily best adapted for human diet because they are the most effective blood-producers. In deciding the value of an article for food, other things are to be looked at besides its nutritive qualities. Those which are poor in nitrogen, are rich in carbon and hydrogen, and are well fitted to serve the double purpose of nourishing and warming the body at the same time. The fitness of an article for diet depends very much upon the ease or difficulty with which it is digested and assimilated. If an article having a great deal of nitrogen, and being very nutritive, is with great difficulty reduced in the stomach by the digestive process, it may be much less desirable for food than one which is digested and assimilated easily, but is much poorer in nutritive qualities.

Heat-generating Food Articles.—The reader has before him the principal blood and tissue-forming food articles. Those which we reckon as fuel, or heat-generators, are chiefly oils, sugar, starch, farina, sago, arrowroot, tapioca, gums, etc. These are less essential than the others; for the blood-forming articles have within them the elements out of which fat is formed in the process of assimilation; for

many of them contain starch; and this, in the human organism, is changed into fat. The amount of starch in some of these articles is as follows:—

Wheat flour, good quality, 100, contains 65 to 66 parts in 100 <i>pure starch</i> .					
Wheat	108	"	53	"	56
Barley meal	119	"	64	"	65
Barley	130	"	37	"	37
Rye	111	"	44	"	47
Buckwheat	108	"	43	"	44
Indian Corn	138	"	65	"	66
Rice	171	"	85	"	86
Peas	69	"	38	"	39
White Beans	59	"	37	"	38

In the Nutritive Food Articles, there is a fixed relation existing between the elements of the tissue-formers and the heat-producers which they contain. Out of a few of them Baron Liebig has constructed the following table:—

For every ten parts of blood and tissue-formers there are,—

In Wheat flour, 10	46	In Barley, 10	57
In Rye meal, 10	57	In Rice, 10	123
In Oatmeal, 10	50	In White potatoes, 10	86
In Buckwheat, 10	130	In Blue potatoes, 10	130

Diet a Complex Subject.—From the facts and tables now presented, it appears that the question of diet is one of complexity; and that the determination of its several points requires that a number of things should be taken into the account. First, in deciding the usefulness of any article, we may inquire respecting—

Its Digestibility.—If an article be not digestible, it is of little consequence how much or how little albumen, starch or nitrogen it may contain. The first and most important inquiry respecting it, is it *digestible*? If not, it is to be rejected; for, whatever other qualities it may have, it can only injure the stomach and embarrass the whole system.

The following table will be useful to the reader, though I do not set it down as reliable in all cases. There is often a great difference in the ease with which different stomachs will digest the same food. Many stomachs are afflicted with what is called an idiosyncrasy,—a habit, peculiar to itself, of rejecting or refusing to digest some one or more articles which are acceptable to all other stomachs. This table shows the length of time required for digesting the several articles in the stomach of St. Martin, as shown by the experiments of Dr. Beaumont:—

Articles.	Preparations.	Time.	Articles.	Preparations.	Time.
		h. m.			h. m.
Rice	Boiled	1 —	Pork, recently salted	Raw	3 —
Pig's feet, soused	Boiled	1 —	Soup, chicken	Boiled	3 —
Tripe, soused	Boiled	1 —	Oysters, fresh	Roasted	3 15
Trout, salmon, fresh	Boiled	1 30	Pork, recently salted	Broiled	3 15
" " "	Fried	1 30	Pork steak	Broiled	3 15
Apples, sweet, mellow	Raw	1 30	Corn bread	Baked	3 15
Venison, steak	Boiled	1 35	Mutton, fresh	Roasted	3 15
Sago	Boiled	1 45	Carrot, orange	Boiled	3 15
Apples, sour, mellow	Raw	2 —	Sausage, fresh	Boiled	3 20
Cabbage, with vinegar	Raw	2 —	Beef, fresh, lean, dry	Roasted	3 30
Codfish, cured, dry	Boiled	2 —	Bread, wheat, fresh	Baked	3 30
Eggs, fresh	Raw	2 —	Butter	Melted	3 30
Liver, beef's fresh	Boiled	2 —	Cheese, old, strong	Raw	3 30
Milk	Boiled	2 —	Eggs, fresh	Hard boiled	3 30
Tapioca	Boiled	2 —	" "	Fried	3 30
Milk	Raw	2 15	Flounder, fresh	Fried	3 30
Turkey, wild	Roasted	2 18	Oysters, fresh	Stewed	3 30
" "	Boiled	2 25	Potatoes, Irish	Boiled	3 30
" domesticated	Roasted	2 30	Soup, mutton	Boiled	3 30
Potatoes, Irish	Baked	2 30	" oyster	Boiled	3 30
Parsnips	Boiled	2 30	Turnip, flat	Boiled	3 30
Pig, sucking	Roasted	2 30	Beets	Boiled	3 45
Meat hashed with } vegetables }	Warmed	2 30	Corn, green, and beans	Boiled	3 45
Lamb, fresh	Broiled	2 30	Beef, fresh, lean	Fried	4 —
Goose	Roasted	2 30	Fowls, domestic	Boiled	4 —
Cake, sponge	Baked	2 30	" "	Roasted	4 —
Cabbage-head	Raw	2 30	Veal, fresh	Broiled	4 —
Beans, pod	Boiled	2 30	Soup, beef, vegeta- } bles, and bread }	Boiled	4 —
Custard	Baked	2 45	Salmon, salted	Boiled	4 —
Chickens, full-grown	Ericsesed	2 45	Heart, animal	Fried	4 —
Apples, sour, hard	Raw	2 50	Beef, old, hard, salted	Boiled	4 15
Oysters, fresh	Raw	2 55	Pork, recently salted	Fried	4 15
Bass, striped, fresh	Broiled	3 —	Cabbage, with vinegar	Boiled	4 30
Beef, fresh, lean, rare	Roasted	3 —	Ducks, wild	Roasted	4 30
" steak	Broiled	3 —	Pork, recently salted	Boiled	4 30
Corn cake	Baked	3 —	Suet, mutton	Boiled	4 30
Dumpling, apple	Boiled	3 —	Veal, fresh	Fried	4 30
Eggs, fresh	Boiled soft	3 —	Pork, fat and lean	Roasted	5 15
Mutton, fresh	Boiled	3 —	Suet, beef, fresh	Boiled	5 30
" "	Boiled	3 —	Tendon	Boiled	5 30

This table may be considered as giving a general idea of the relative digestibility of the food-articles contained in it. If not found exactly right in each individual case, it can be rectified by experience. The experience of no other individual's stomach will ever be found precisely like that of St. Martin's, — though in its general features, it may be sufficiently similar to make his valuable. The general principles of conduct may be learned from the experience of others. The particular application must come from our own experience and reason.

Digestibility Influenced by Amount.— The rapidity with which any article is digested will vary with the amount taken. A larger quantity than is called for by the wants of the system will be digested more slowly than the proper amount; while, on the other hand, an insufficient supply begets an inability to reduce in the stomach even the small quantity taken. We may err in taking too

little food as well as in taking too much; though the former error is much less likely to occur than the latter.

Choosing Food in Ill Health.—But in deciding the *kind* and *amount* of food we must be guided not only by its digestibility, but by the state of the health.

If we find the stomach apparently in good working condition, capable of dissolving properly whatever is submitted to its action, and yet we are for some cause losing flesh and strength, we should resort not only to the most nutritious of the albuminous group of the azotized articles, but likewise to the oleaginous group of the non-azotized. We want a great amount of nutriment, and we need oils to make fat. This is the kind of food generally wanted in constitutional consumption.

In fevers, but little food can be disposed of at best; and that little must be chosen with reference to its mildness and its unstimulating qualities. Generally the farinaceous or starchy articles are most suitable, because they have no stimulating and irritating qualities, and especially because they furnish fuel to be burned with oxygen, and thus take the place of the animal tissues, which are being rapidly consumed with this devouring element. In fever, oxygen is literally burning up the body. In this state of the system, this element acquires, by some means, a singular affinity for the tissues; and, uniting with them rapidly, forms a true combustion. The physician who throws to this devouring agent some of the mild, non-azotized articles which offer it stronger affinities than it finds in the tissues, is as wise as he who tosses his dog to a hungry lion to avoid being devoured himself.

Exercise to be Considered.—In deciding the diet, the amount of exercise is not less important to be considered than the health. The farmer, who works in the open air, and uses his muscles a great deal, wants considerably more nutritive, as well as more combusive, food than one who leads a sedentary life. Of course there is a great deal more waste of the tissues, and he requires more of the flesh-forming articles; and as he breathes deeper, and takes in more oxygen, he needs more of the supporters of respiration, — the sugars, oils, and starchy aliments.

Beans.—By turning to the table which shows the amount of nitrogen in the different food-articles, the reader will see that *beans* are rich in this element. They are, therefore, excellent food for working men, who are obliged to make great use of their muscles. Our fathers, who broke and subdued the rocky soil of New England, showed wisdom even in their instincts in taking so large a portion of their aliment from the bean, — especially as they *oiled* it with the fat of pork. But for the hard-working *student*, who daily makes heavy drafts upon his brain and nervous system, beans and peas are an improper diet. They contain no *phosphorus*, in the shape of

phosphate of lime; and no brain can work hard without a due supply of phosphorus, which forms a part of its substance.

Unbolted Wheat Flour.—For the man who uses his brain a great deal, there is no other *one* article of food equal to bread made from unbolted wheat flour. Fine wheat flour is little better for him than beans, because the miller has robbed it of much of the phosphorus, which is found chiefly in the hull or bran.

I mention only two or three articles of food as specimens. By looking over the tables furnished, and reasoning upon the whole in the way I have done upon these few, the reader can give every article something like its proper value in most circumstances.

Climate.—If health and exercise should influence us in choosing the kind and the amount of food, *climate* must do so quite as much.

In the frigid climate of high latitudes, it is necessary that a great deal of heat be produced in the body, in order to avoid perishing with cold. There is no mystery now, as there once was, about the production of this heat. It comes from the burning of carbon and other substances in the body, where they unite with oxygen, and make just as real a fire as that which warms our houses. Oils, sugar, starch, gums, etc., are largely composed of carbon, and readily unite with oxygen in the body. This is the reason they are reckoned as *fuel*, and are called *supporters of combustion*. And for this reason, they require to be largely consumed in very cold climates. The instincts of men seem to lead to the same conclusion, for the dwellers in all high latitudes consume great quantities of oils and fats. The amount of train-oil, tallow, the fat of seals and other animals, devoured by the Laplanders, Kamtschatkans, and other northern people, is truly wonderful.

In hot countries, the fundamental rule for preserving the health is to keep the body cool. Without observing this rule, the strongest will often fall victims to the climate in low latitudes. But to keep cool, of course all the heat-producing articles of food should be avoided. Particularly all alcoholic drinks, which are powerful supporters of combustion, should be rejected. Rice and the various fruits form the most suitable articles of diet.

The great sacrifice of life witnessed among the early emigrants to California, was the result chiefly of using ardent spirits and heat-producing food while crossing the Isthmus, which, to a northern constitution, is much like a vast oven, heated to a temperature suitable for baking bread. There are few persons, with tolerable health and strength, but could safely endure the hottest climate if they would avoid alcoholic liquors and confine themselves to an abstemious vegetable and fruit diet.

Bayard Taylor's Opinion.—The distinguished traveller, Bayard Taylor, reports that while spending a few days in a heated part of **Africa**, he lived as the inhabitants did, pretty much entirely upon the

flesh of well-fatted sheep ; and that he enjoyed, meantime, excellent health and strength. From this he concludes that animal food is as suitable in hot climates as in cold.

It is a pity a man of such excellent parts as Mr. Taylor should have allowed himself to rear so tall a structure upon so narrow a foundation. That he could live on flesh in so hot a region, and not be made sick, only proved that he had a fine constitution, and that his health was not easily disturbed ; and when he attempted, from his limited experience of a few days, to reason against the established facts of science, and against the well-attested laws of life, he did it evidently without reflecting that he was in a field of thought which he never had occasion to cultivate.

The great Jewish Lawgiver doubtless had a reason for prohibiting pork to the Jews. Whatever that reason was, the prohibition had a wise bearing upon the health of the people. Palestine has a hot climate, in which pork-fat is an improper diet.

More Fat in Winter.—It follows from what has been said, that a more fatty as well as stimulating diet is needed in winter than in summer. But the change should be made gradually. When cold weather approaches, the food should become more nutritious and warming by little and little. The exercise should likewise be increased.

Even the lower animals act upon this plan. In the fall, squirrels eat nuts, which are full of oil, and grow fat upon them.

The instincts of men move in the same direction. It is in the fall that the hog, the ox, and the poultry are killed ; and in the winter that they are largely feasted upon and enjoyed. Upon such food, combined with various sorts of starch, man fattens ; and a good supply of fat, deposited in the cells, is equal, in keeping out cold, to a layer of cotton batting, — to say nothing of the fire kept up within the body by the burning of such fuel. As hot weather comes on, we gradually lay aside these fattening articles (or ought to), and return to the watery vegetables and fruits, such as squash, string-beans, strawberries, currants, etc.

Few of us, I apprehend, would suffer from heat in summer, if we could persuade ourselves to abandon stimulating and fire-producing food, and confine ourselves pretty much to a cooling and succulent diet. Diarrhoeas in summer are not induced by eating wholesome vegetables, but by combining them with large quantities of animal food.

The State of the Mind.—This should by no means be overlooked in choosing the kind and the amount of food. If we have lost friends, or heard desponding news, or experienced calamities of any kind, we must, during the first hours of the shock, or even during the first days, if the affliction be heavy, partake very sparingly of food. The stomach is in no condition to receive it. The brain lies pros-

trate under the stroke, and the stomach, in sympathy with it, asks for a day of sorrow and fasting. Disturb it not.

Heat-producing Food Incompatible with Excitement.—It is folly to take heat-producing aliment when laboring for days under high excitements. During political campaigns, when the blood of politicians is at the boiling point, the diet should be unstimulating, — containing very little animal flesh, and not much combustive food. Many a man has died of apoplexy, or of heart-disease, by putting on the steam when his blood was up. Whenever we have a day of uncommon excitement to pass through, we should always begin and end it with an unusual degree of abstinence as to the amount of food taken, and with special care that the articles be of the highest kind.

Anger Demands Abstinence.—Anger is a passion which especially unfits the stomach for doing much work. If it occur often, or be protracted, but little food should be taken. Those who indulge it have a double cause for abstinence. Both their folly and their stomachs call for a fast.

Food Adapted to Different Periods of Life.—Food must vary in different periods of life. The infant needs a fattening diet; and this has been supplied in the milk of the mother, which contains more *butter* (the fattening portion) than the milk of any other animal. But as the infant has much less exercise than the young of animals, its flesh is not wasted, and it does not require so much *azotized* food, that is, the reader will remember, food with *nitrogen in it*. Accordingly, it will be seen by looking at the table on page 70, that human milk has much less of this element than that of the cow. As the child grows up, and begins to take active exercise, indoors and out, it wants more solid food, and teeth make their appearance to masticate or chew it.

In Youth and Manhood, the great amount of exercise usually taken calls for larger supplies of azotized aliment, — beef, mutton, pork, fowl, fish, wheat-flour, corn-meal, rye-meal, potatoes, turnips, peas, beans, etc. This is the working part of life, when the tissues are rapidly wasted by action, and the *flesh-forming aliments* are wanted to keep them good.

In Old Age, the exercise is diminished, the blood circulates more slowly, and the body grows cold. Now is the time to resort to *non-azotized* food, — oils, fats, the various kinds of starch, sugar, and the like. These will furnish fuel to warm the sluggish blood, and will invest the body with fat, which will serve the purpose both of a cushion and a garment. Wine, beer, porter, and distilled spirits are never needed by young persons in health; but the aged are frequently benefited by them, if taken in small quantities. They are chiefly composed of oxygen, hydrogen and carbon, and are properly ranked with

the supporters of combustion. They are likewise stimulant, and add to the comfort of the old by quickening their circulation. Like tea and coffee, they diminish the waste of the body, and thereby lessen the demand for food.

The smallest amount of aliment upon which a healthy adult person ever lived for any length of time, was twelve ounces a day. Upon this small daily allowance, Lewis Cornaro, a noble Venetian, subsisted in perfect health, during the protracted period of fifty-eight years. This he was able to do only by adding daily to his food about twelve ounces of light wines. I shall have occasion to refer to this case again.

Cost of Food.

ONE other consideration must ever influence the great majority of men in selecting their food. I mean its cost. It is a matter of great importance to the poor, to know what kinds of food they can subsist upon with least expense. Sometimes provisions are so high that persons in poor circumstances greatly need advice in this matter. Let me endeavor to furnish some information which shall be of service to the reader.

Milk is supplied by nature to be our first food, and is a good type of all alimentary substances. It contains *curd*, which has nitrogen, and is equivalent to albumen and fibrin, and represents the *blood-formers*. It has butter and sugar. These represent the *heat-formers*. It has salts, which contain potash, soda, phosphorus, etc. Fig. 64 is a microscopic view of good milk; Fig. 65, of poor milk; and Fig. 66, of milk adulterated with calf's brains.

Food will be valuable in proportion as it combines, in due proportion, the articles contained in the four groups, represented by *albumen*, *fat*, *sugar*, and *salts*.

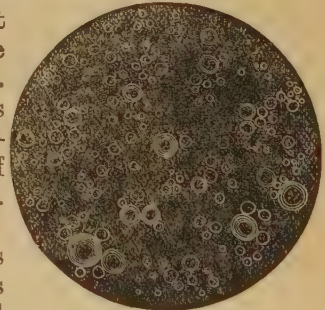


FIG. 64.

Albuminous Group.—Albumen, fibrin, casein, and gluten, all enter into the substance of animal and vegetable bodies, and are all composed of the same elements, namely, 48 parts carbon; 36 of hydrogen; 14 of oxygen; and 6 of nitrogen. In containing nitrogen they all differ from the other three groups. Albumen being a good type of them, they are called albuminous compounds. Albumen forms a large portion of the serum, or colorless part of the blood. It is the leading principle in alimentation. It is worked up into the tissues of our bodies. It forms our muscles, our membranes, a portion of our nerves, etc. It is the bricks of which the house we live in is made. All the articles, therefore, which are chemically constituted like it, may well be termed albuminous.

These bodies, consisting of the four organic elements named above, have been called *quaternary compounds*. Besides these elements, they have a minute portion of sulphur and phosphorus. They are also called *protein* or *proteinaceous compounds*.

Albumen is a very unstable compound,—tending strongly to decomposition. This is owing to the complexity of its composition,

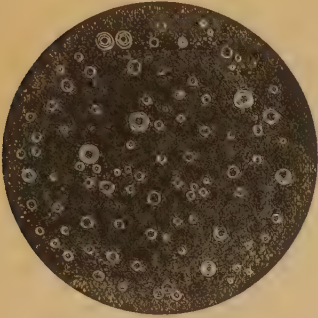


FIG. 65

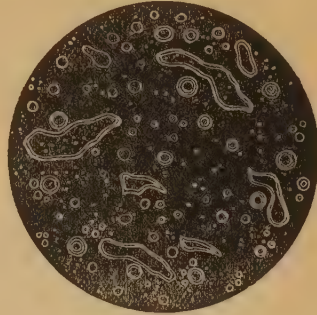


FIG. 66

and to its union with the fickle element, nitrogen, which forms chemical compacts reluctantly, and breaks them without remorse. Substances which coagulate or fix albumen in an insoluble compound, or preserve the tissues of the body, which are made from it, from decomposition or putrefaction, are called *antiseptics*.

Fatty Group.—The next group, represented by fat, performs very important offices in the system,—the most important of which is a union with albumen in the formation of cells. All animal and vegetable life begins with the cell,—the tiny cup, with which nature dips all the streams of life out of the great fountain of inorganic matter. No cell is formed without a minute particle of oil. The portion not used in forming cells, is either burned as fuel to keep us warm, by uniting with oxygen, or it is stored away in the cellular tissues, adding to the bulk of the person. If, then, the very beginnings of life are dependent upon fat, it is of great importance as an article of diet. So necessary is it in the economy of life, that when not taken in the food, it is formed out of albumen in the processes of assimilation.

The Starch and Sugar Group, composed of several kinds of sugar, gum, etc., is never used in forming the tissues, but they perform important offices in the changes going on within the human organism. Thus, sugar of milk is decomposed, and forms lactic acid, so called from being found in sour milk. This acid plays a very important part in the process of nutrition.

Pure starch is a snow-white powder, having a glistening aspect. It is composed of grains from $\frac{1}{300}$ to $\frac{1}{3000}$ of an inch in diameter in the different grains; being largest in the potato and smallest in wheat. When examined with the microscope, they appear as in Fig. 63.

The Salts Group are sufficiently spoken of in another place.

A wise philosopher in ancient time said, "I do not live to eat and drink; I eat and drink to live." If we intend to eat to live, we must combine, in our food, the four groups above explained; and if we would live at as small expense as possible, we must take those articles which are low in price and rich in nutritive matter. The following table will help the reader make this selections:—

Table of the relative value of articles of food arranged according to their proportions of nutrient matter in each of the four groups of elements concerned in vital changes.

In 100 pounds of	Water.	Husk or woody fibre	1st Group. Albuminous substances.	2d Group. Fats.	3d Group. Starch and Sugar.	4th Group. Salts.
GRAINS:						
Wheat	15	15	10 to 19	2 to 4	55	2
Barley	15	15	12 to 15	2 to 3	60	3
Oats	16	20	14 to 19	5 to 7	60	4
Rye	12	10 to 20	10 to 15	3 to 4	60	2
Indian Corn	14	6	11	8.1	74	1½
Buckwheat	15	25	8	0.4	50	4
Rice	13	3	7	0.7	79	0½
POD PLANTS:						
Beans	14	8 to 11	24 to 28	2 to 3	40	3
Peas	14	9	24	2.1	50	3
ROOTS:						
Potato	75	4	2.1	0.3	18	¾ to 1½
Turnip	88	2	1.5	0.3	9	½ to 4-5
Carrot	85	3	1.5	0.4	10	1½ to 2
Beet (mangold wurzel)	85	2	2		11	¾ to 1
Long red	85	3.03	0.48		10.36	1¼
Short red	85	3.31	0.26		12.46	.75
Sugar beet	85	2		0.35	13	
Parsnip	80	1.5	2.5		16	½
LEAF:						
Cabbage			30 to 35			
MEAL:						
Wheat flour	15		10.8	2	70.5	
Ryemeal	15	4.63	8	2	73	2
Barleymeal	15		6.3	2.4	74	2
Oatmeal	15		12.6	5.6	64	3
Wheat bran	13.1	55	19.3	4.7	.6	7.3

The following tables have an admirably practical bearing upon economy in food:—

100 lbs.	Muscle- forming Elements, in lbs.	Fat-forming Elements in lbs.	Relative Propor- tion of each, in lbs.	Husky, or Woody fibre, in lbs.
Barley	14	64	1 to 4½	15
Beans	26	42	1 to 1¾	10
Beets	2	12	1 to 6	(?)
Buckwheat	8	54	1 to 6¾	25
Carrots	1½	10	1 to 6¾	3
Corn	12	77	1 to 6½	6
Oats	17	66	1 to 4	20
Peas	24	52	1 to 2¼	8
Potatoes	2	19	1 to 9½	4
Turnips (field)	1½	9	1 to 6	2
Do. (Swedish)	2½	12	1 to 5½	2
Wheat Flour	11	79	1 to 7	
Wheat Bran	18	6	1 to ¾	55
Cheese (whole milk)	28.4	51.1	1 to 1¾	
Cheese (skim-milk)	49.8	6.3	1 to ½	

Articles.	Cost.	Muscle-producing Elements.	Cost of Muscle-producing Elements.
Barley	\$1.00 per bu.	8.4 lbs.	12c. per lb.
Beans	1.80 "	16.6 "	11c. "
Corn	0.50 "	6.7 "	7½c. "
Oats	0.35 "	5.2 "	7c. "
Peas	1.00 "	14.3 "	7c. "
Potatoes	0.85 "	1.6 "	53c. "
Turnips	0.50 "	1.2 "	41c. "
Flour (fine)	5.00 per bbl.	22.0 "	23c. "
Flour (unbolted)	4.50 "	24.8 "	18c. "

These tables will well repay study, for their practical use will save many dollars to the poor. Let it be remembered that producing muscle is the same thing as producing strength, or *labor-power*. Bearing this in mind, the following table will be very interesting:—

One pound of labor-power from	Potatoes costs 53c. per lb.
" " " " " "	Fine Flour, 23c. "
" " " " " "	Unbolted do., 18c. "
" " " " " "	Turnips, 41c. "
" " " " " "	Barley, 12c. "
" " " " " "	Corn, 7½c. "
" " " " " "	Beans, 11c. "
" " " " " "	Peas, 7c. "
" " " " " "	Oats, 7c. "

Meats are omitted in the table. So far as their nutritive qualities are concerned, it is of little consequence which are taken. Some are more digestible than others, and this consideration should influence those with weak stomachs in selecting. Every person, of course, knows their relative cheapness.

Among the vegetables given in the table, there is a wider range for choice. Let us consider them in course.

Wheat.—In this, the four groups are represented in excellent proportion. When not deprived of the bran, it is perhaps the very best supporter of animal life. So high have been the regards of men for it, and so generously have they awarded to it their acknowledgments, that its product, bread, has been everywhere called "the staff of life." The settlement and cultivation of the immense prairies of the West have within recent years so increased the production of wheat, that its cost is now less than half what it was fifty years ago, and it is indeed within the means of all in America.

Barley.—This has the four groups represented in nearly the same proportions as wheat. It is, therefore, nearly as valuable an alimentary grain. Unfortunately it is not so toothsome as wheat, and can never be so popular an article of diet. The Scotch, however, feed upon it with apparent relish, and doubtless think it strange that foreign palates are not better pleased with it.

Oats.—This grain, strange to say, has more albuminous, or nutritive matter, more fat, more starch, and more salts than wheat. In uniting a large quantity of the four alimentary groups, it surpasses

every other vegetable substance. In albumen, it is not quite as rich as peas and beans, and in starch it falls a trifle below fine wheat flour; but in fat it is exceeded only by Indian corn. This grain is likewise consumed largely by the Scotch, — a people whose claims to shrewd common sense are well supported by, as their hardy constitutions vindicate, the choice. This grain might well be permitted to take the place of rice. It affords several times as much nutriment, while it costs only about one-fifth as much. There is good reason why the horse should thrive upon oats. Most stable-keepers think their horses will do more work upon corn-meal, but this must be a mistake. In using oats for horse-feeding, a large portion of the nutriment is lost by not *grinding* them.

Rye. — This is also a grain of considerable nutritive value. It is much cheaper than wheat; and rye meal has long been a standard article of diet in New England,— particularly in connection with Indian meal, as “brown bread.” It is useful for relieving costiveness, in the form of “hasty-pudding,” with molasses.

Indian Corn. — This staple article of American produce needs no praise from me. It is comparatively cheap, nutritive, and wholesome. It abounds in fat and starch, and has a fair amount of albumen, though not as much as the oat, the barley, or the wheat. In salts, it is rather deficient. Indian corn is strictly an American plant, and is perhaps the most popular grain in the country. It has emphatically a national reputation, and is perhaps worked up into more savory dishes than any other. At the South it is an institution. It is there made into hoe-cake, corn-cake, batter-cakes, batter-bread, muffins, corn-pone, etc. At the North, we have johnny-cake, Indian and pumpkin-cake, baked Indian pudding, boiled Indian pudding, beside the well-known rye and Indian bread, and other preparations. Give an ingenious Southern or Northern housewife a few simple adjuncts, such as lard, milk, sugar, eggs, cream of tartar, and soda, and she will make a pretty respectable larder from this single grain. If molasses be substituted for sugar, and a little stewed pumpkin be thrown in by way of garniture, we may have several preparations which are very nourishing as well as cheap.

Buckwheat. — Poor in nutritive matter, fat, starch, and sugar, but tolerably well supplied with salts. It will do very well for batter-cakes in winter. When brought smoking upon the table, and served with sugar or molasses and butter, these cakes are a luxury, in which the rich may indulge if they choose; but for the poor, the amount of nourishment they afford is too small for their cost.

Rice. — Much like buckwheat, except that it has more fat, sugar, and starch, and less salts. As an article of diet, it has had too high a reputation. Those who would live on small means cannot afford it. Boiled in plain water, it is excellent for a relaxed state of the bowels; and this is about all the commendation to which it is entitled.

Beans.— The richest in nutritive matter of all vegetable substances, except cabbage and oats. They have more albumen than wheat, or corn, or barley, or oats; but in fat and starch they are lower in the scale. Add to them salt pork, and the highest of all nutrient compounds is obtained. During not less than four generations, pork and beans, as the principal diet, nourished an iron-sided race of men in New England. Bean-porridge was like honey upon the tongue of the founders of New England institutions. They ate it morning, noon, and night; and thanked God for it every time. And well they might thank Him; for, with Indian corn, it furnished them with a diet better adapted to their condition than any other.

Peas.— Not quite as rich as beans in albumen, but more rich in starch, is of about the same value on the whole. The Canadian French, in Lower Canada, feed on peas to about the same extent that the New Englanders did on beans. Pea-soup, as prepared by the best cooks among them, is a dish of great nutritive excellence; and, in my judgment, more palatable than bean-soup.

The Potato.— Three-quarters of this root is water, and it is poor in all the elements of nutrition. It is a palatable article, and most persons are much attached to it. As *bulk* is of some consequence in food, the potato is not without value. Men do not often live entirely upon potatoes,—not even in Ireland. Milk, butter-milk, and especially cabbage, are united with them.

Turnips, Carrots, Beets, Parsnips.— These are much alike,—being all poor in nutritive qualities. They serve to please the palate by furnishing a variety; but in our city markets they are expensive, and do not furnish an economical diet.

Cabbage.— It is interesting to observe how the instincts of men have in all ages led them to select those articles of diet which their circumstances have demanded. The poverty of the Irish has led them to subsist largely upon the potato,—a root which the soil of their country yields profusely. But as this root has but little nutritive matter, necessity required that it should be united with some other vegetable. The natural instinct selected the cabbage; and when chemical science came, at length, to pass judgment upon the correctness of this instinct, it turns out that the cabbage is the richest in albumen of any known vegetable. The cabbage, then, is the natural complement of the potato; and the Irish had the sagacity, without science, to bring the two together. It is said the Irish have a dish named “kohl-cannon,” consisting of boiled and mashed potatoes and cabbage, seasoned with pork fat, pepper, and salt, and that it is a truly savory dish. It certainly is a nourishing and a cheap one. The ambassador who was sent to tamper with the patriotism of a Roman who had dined on beans, was asked if he was silly enough to think gold and silver could bribe a man who was satisfied with so plain a

fare, and desired no other. We come to the conclusion then, that bean-porridge, pea-soup, suet-pudding sweetened with molasses, oat-meal, and barley-bread, with "kohl-cannon" for those who can digest it, will furnish, for hard-working men, the most substantial diet, at the smallest possible expense. To render these dishes savory, and to make the table on which they are spread an inviting board, the deft housewife must employ her best skill in serving them. With the thousand "fixings, with which a New England matron knows how to garnish them (or would know how if they came within her culinary operations), they are well fitted to leave savory impressions upon tongues which would praise them to the end of life. I speak of these articles as furnishing a cheap diet for working men. The indolent, the sedentary, and the effeminate from various causes, could not digest them.

The Amount of Food Taken.

WE have already explained that this should be governed, in part, by the amount of exercise taken, by the condition of the health, by the state of the mind, by the climate, by the season, etc. It remains to add a few words in a general way, respecting the absolute amount required by an adult man.

It is plain enough that most men eat too much. We come very near, in this country, being a nation of gormands. A principal reason of our over-eating is, that we eat so fast. When the food is well and slowly masticated and swallowed, the gastric juice has time to mix with it; and at the proper moment the appetite ceases. But when our food is bolted rapidly, nature, finding her laws disregarded, and all her purposes frustrated, stands back, and lets us learn to stop, too late, alas! from a sense of fullness in a stretched and abused stomach.

It has already been stated that Lewis Cornaro lived fifty-eight years, namely, from the age of forty-two to one hundred, on twelve ounces of solid food a day, with about the same amount of light wines. At the age of eighty-four he wrote a book, in which he praises "divine temperance" in terms which are sometimes eloquent and often enthusiastic. Indeed it is very rare that a man at that age retains such clearness of intellect, and especially such freshness of feeling as he evinces in his book. Probably but few could live on the amount of food which he found sufficient. Yet it is said the distinguished John Wesley lived on sixteen ounces a day, which, as he took no wine, and had to derive the combustive materials for warming the body from the food, was quite as scanty a fare as that of Cornaro. Considering that he led a most extraordinarily active life, both of body and mind, being half his waking hours in the saddle and preaching almost daily, this is probably the most remarkable case of abstemiousness on record. Jonathan Edwards did not, I think, exceed the same amount of food, but he was not so active a man.

Putting aside such exceptional cases as these, we may say in round numbers, that a laboring man requires, to keep him in health, about two or two and a half pounds of solid food per day. For ministers, lawyers, doctors, authors, and merchants, one pound and a half is amply sufficient. The amount should be increased a little by a selection from some of the fuel-formers, if no fermented or alcoholic drinks be taken, and slightly diminished if they are used. The reason is that these drinks furnish fuel to be burned in breathing, which has to be drawn from the food when they are not employed. This furnishes no motive for *using* ardent spirits; for there is fuel enough to be had in the oils, starches, and sugars.

Dyspeptics. — It is said that dyspeptics eat more than persons in health; and, in many cases, the remark may be true. The appetite of a person suffering from this disease is almost always morbid, and the information it gives respecting the real wants of the system can seldom be trusted. If we allow a diseased stomach to dictate to us when and what and how much we shall eat and drink, our misery for life is a foregone question. A sick stomach is like a spoiled child, — it cries for what it should not have. If the dyspeptic will live, and enjoy any amount of peace and comfort, he must follow this simple rule: *To eat no more than can be digested, even though the amount be only an ounce a day.*

Animal and Vegetable Food.

It has generally been supposed that it was intended man should subsist on a mixed diet, consisting of both animal and vegetable substances. Within the last fifty years, however, a school of physiologists have appeared, who affirm that a vegetable diet is alone consistent with the laws of health. They declare that animal food is not adapted to man's organization, — that it unduly stimulates the blood, predisposes to fevers, consumptions, diarrhoeas, choleras, apoplexy, and numerous other diseases, and of course shortens life. That such a school should have come into existence in this country, where animal food is more largely consumed than in any other part of the world, in proportion to the number of people, is not surprising. We do, undoubtedly, eat too much flesh. So enormous is the consumption, that notwithstanding the vast herds of cattle raised in all our agricultural states, and especially on the western plains, the demand keeps up with the supply so well that beef brings, on an average, about twenty cents per pound, — at least twice its full value as a blood-former.

Facts show that man may live upon flesh alone, upon vegetables alone, or upon flesh and vegetables combined. Is it *best* he should subsist upon vegetables only, or upon a mixed diet? A mere affirmation upon these points is of little consequence. To cite facts avails nothing. Men have a way of making their own affirmations, and of

looking at facts with eyes which sometimes see clearly enough on both sides of them, but totally ignore their existence.

Man's Structure Settles the Question.—To settle this matter, we must appeal to man's organization. His structure will tell us something we need not mistake. All the works of God show design. Everything he has made has a use, and is so contrived as to be adapted to that use. Lions, tigers, and other animals, for example, which feed on flesh alone, have a *short* second stomach, — it being only about three times the length of the animal's body. Animals which eat no flesh have a long second stomach, — that of the sheep being from thirty to thirty-five times the length of its body. A very remarkable difference of anatomical structure.

This is the meaning of the difference : Vegetable food has a great deal of waste matter in it. Woody fibre makes quite an item in its composition. This waste portion must be carefully separated from the nutritive part, and this must all be done in the second stomach. It takes time to do it. It must not be done in a hurry. The nutritive materials are destined to build a living structure, whose duration, like that of all other fabrics, will depend on the care with which the materials are selected and put together. The second stomach of the sheep is long, that there may be ample time for the mixed mass of chyme, when it passes out of the first stomach, to be changed to chyle, and then to be carefully separated into the two parts, the useful and the useless. Animal food is in its composition just like our own flesh, — there is little waste matter, and not much time is required for its separation ; hence, the second stomach of flesh-eating animals is short. Nearly the whole alimentary mass is quickly taken up by the lacteals, and there is no occasion for its travelling through a long second stomach.

Man's second stomach is in length midway between that of the flesh-eating and the vegetable-eating animals. If there be design in the works of the Creator, and if that design in the structure of the flesh and vegetable-consuming animals has now been correctly interpreted, it is plain that man is best nourished when he eats both kinds of food. The structure of his teeth and the motions of his jaws (see p. 30), confirm the same conclusion.

Americans Eat too Much Meat.—Yet, as I have said, there is no doubt the Americans eat too much meat. Sedentary persons require but very little. Less is wanted in summer than in winter, — in warm climates than in cold. People of wealth, whose circumstances impose no bodily hardships, need less than the poor, who are much exposed, and work hard ; whereas, they consume more. Those who do not labor with their hands, should never taste meat more than once a day.

It is painfully-amusing (if such a compound word is admissible) to hear a nervous female, whose sole exercise consists in going from

the parlor to the kitchen once or twice a day, and in making a brief shopping excursion once a week, complain that she cannot maintain her strength unless she eats freely twice a day of meat, and takes her free potations of strong coffee and wine.

A like opinion prevails generally among the feeble who are not obliged to labor. The child in its nurse's arms must daily, it is thought, suck a piece of chicken or beefsteak in order to thrive. Children thus fed have their blood constantly inflamed, and stand a poor chance when attacked by scarlet fever. The little master or miss who attends school complains of headache, and grows pale, feeble, and nervous. The books are blamed and thrown aside for what the dishes have done. The doctor is called in and assured that the dear child can eat nothing but a little fat broth, a custard, or cake; and if he prescribe a diet of plain bread and milk, he is believed to be heartless, and his prescription is not followed.

The Majority of Mankind Eat no Flesh.—All such misguided persons should be apprized that the great majority of mankind eat no flesh, because they cannot afford it. And they do not appear to suffer from its loss. Millions of Irish do not taste of flesh or fish from one month's end to another. Potatoes, oatmeal, and cabbage constitute their chief diet. Rice, poor as it is in nourishment, sustains, when combined with vegetable oil, millions of people in Asia. The Lazaroni of Naples, with active and finely moulded forms, live on bread and potatoes. These facts do not afford ground for altogether rejecting animal food, any more than Bayard Taylor's statement respecting whole tribes in Africa who live upon flesh furnishes a reason for excluding vegetable aliment. Man may live and enjoy health upon either, but his organization implies the use of both.

Proportions of Animal and Vegetable Food.

UPON this subject, it is impossible to fix any absolute rules. This is a point which must be determined by the temperament, the state of the health, the constitution, etc. Persons of a scrofulous habit should eat freely of animal food. But an inflamed stomach should never be tormented with flesh. Meat is stimulating, and will be almost sure to do mischief when there is heat and tenderness at the pit of the stomach. There are cases of inflammation of this organ, in which it may be necessary to live on bread and milk, with articles of the *starch group*, for months, and even for years.

On the other hand, when the system has run low from some exhausting disease, which excites no feverish action, it may be necessary at times to take a diet almost exclusively animal.

It is absurd to talk of the same diet as adapted to all persons, even when in health. As well might we expect one shoe to fit every foot, or one coat every back, or one color every eye, or one doctrine every mind.

Temperance the Main Thing. — After all, the great thing to be aimed at is temperance. It is not so necessary to reject one article and use another, as to partake of all with moderation, "I do not live to eat and drink; I eat and drink to live," said a wise philosopher of the olden time. One would think the moderns have reversed this rule. A modern table has the appearance of being spread for the purpose of inducing men to eat all their stomachs will hold. A man who can dine daily, for half a dozen years, at one of our first-class hotels, and then find himself free of dyspepsia and all other diseases, must have a fine constitution, as well as most admirable control over his appetite. Mr. Addison said, "When I behold a full table set out in all its magnificence, I fancy I see gout, cholic, fevers, and lethargies lying in ambuscade among the dishes"; to which he adds, with much truth, in another place, "Abstinence starves a growing distemper."

Good Results of Temperance. — A temperate diet has always been attended with excellent results, and always will be. There are times of great anxiety, when abstinence should be pushed to the extreme verge of endurance. During the siege of Gibraltar, Lord Heathfield, its gallant defender, lived eight days on four ounces of rice per day. Dr. Franklin, when a journeyman printer, lived two weeks on bread and water, at the rate of ten pounds of bread a week, and was stout and hearty. Dr. Jackson, an eminent physician in the British army, says, "I have wandered a good deal about the world, and never followed any prescribed rule in anything; my health has been tried in all ways; and, by the aid of *temperance* and hard work, I have worn out two armies, in two wars, and probably could wear out another before my period of old age arrives."

Lord Bacon was right in the opinion that intemperance of some kind or other destroys the bulk of mankind, and that life may be sustained by a very scanty portion of nourishment. Cornaro, whom I have before mentioned as having lived fifty-eight years on twelve ounces of solid food a day, wrote as follows respecting himself in his eighty-fifth year: "I now enjoy a vigorous state of body and of mind. I mount my horse from the level ground; I climb steep ascents with ease; and have written a comedy full of innocent mirth and raillery. When I return home, either from private business or from the senate, I have eleven grand-children, with whose education, amusement and songs I am greatly delighted; and I frequently sing with them, for my voice is clearer and stronger now than ever it was in my youth. In short, I am in all respects happy, and quite a stranger to the doleful, morose, dying life of lame, deaf and blind old age, worn out with intemperance." Howard, the philanthropist, fasted one day in the week; and Napoleon, when he felt his system unstrung, suspended his meals, and took exercise on horseback.

Nothing can be plainer than the duty of fasting, when the stomach, having been overworked, is disinclined to receive food.

Brutes invariably follow this suggestion of nature; they never eat when sick,—probably because they have no silly nurses to coax them to swallow stimulating aliments. The habit of putting high-seasoned food into the stomach when it is inflamed and feverish is about as wise as directing streams of blue, violet, or red light into the eye when it is red and swollen with inflammation.

Tea and Coffee.

It is proper, before closing this chapter upon diet, that something should be said respecting the beverages of tea and coffee.

Some years ago, a meeting was held by the leading physicians of a city in the old world, in which the merits of tea and coffee were discussed. In this discussion each man first stated his experience in the use of these articles, and then constructed his argument according to that experience. The amount of what the reader could learn from the discussion was that Dr. A. had used tea all his life, and been benefited by it, while coffee had uniformly injured him; and that he thought tea should be used, while coffee should be rejected; that Dr. B. had taken coffee at breakfast, and found it an excellent support to the stomach and nervous system, while tea had disturbed his digestion and his mind; and that the former was a beverage of excellent qualities, while the latter was detestable; that Dr. C. had always drank both tea and coffee, and recommended them to everybody; and that Dr. D. had himself never been able to indulge either tea or coffee, and would have them both expelled from every household.

The discussion was not creditable to the learned and really able men who participated in it. The arguments were all based upon the miserably narrow basis of single individual experiences. They were no more valid than that of the man who should hold up a shoe, declaring it fitted his foot the best of any he ever had, and recommending all men to have their shoes made upon the same last.

The truth is, there is but one thing which can be affirmed universally of the effect of tea and coffee. They both, when taken, tend to prevent waste in the body, and, consequently, less food is required when they are used. This may be affirmed of them in their applicability to all persons, but nothing further. The truth is, some can drink tea but not coffee, and some coffee but not tea; some can use both, and some neither. Every man's susceptibility to the effects of these beverages is his own, as much as his susceptibility to the effects of light, or heat, or atmospheric changes; and these effects, each person must learn from experience. Coffee often produces, and generally aggravates, a bilious habit,—an effect which cannot, I believe, be traced to the use of tea. I have no doubt but that many cases of confirmed dyspepsia are traceable to the use of coffee alone.

Water.

THERE is one universal beverage; it is water. All men are fond of it. In sickness and in health, in joy and sorrow, in summer and winter, in cold climates and in hot, man loves and drinks water. The stomach, abused and made sick by stimulating food and drinks, and repelling everything else, still gratefully opens itself to water. Wherever man exists, therefore, or wherever he should exist, water is found, either in the form of springs, or running brooks, or rivers, or ponds, or lakes; and even where it is not found in some of these forms, it is periodically dropped down from the clouds. As there is no element in nature more necessary for man's existence than water, so there is none more universally diffused.

Pure Water Essential to Health.— But water varies very materially, both in its physical qualities, and in its adaptation to its purposes. Pure water is as essential to health as pure air. When either of these fluids is rendered impure by mixture with foreign matters, disease will be a frequent result. The ancients must have been influenced by this fact, or they would not have incurred such heavy expenses in procuring pure water from great distances. The strong aqueducts through which, for many miles, large streams of water are even at this day poured into Rome, attest the freeness of the expenditures she made for this purpose in the day of her greatest renown. We may pity the ancient Romans for being governed in their military operations by the opinions of augurs and soothsayers, and certainly these things were silly enough; but in other things, at first view equally superstitious, they showed practical wisdom. Vetruvius reports that in selecting the sites of their cities, they inspected the livers and spleens of animals to learn the salubrity of the waters and the alimentary productions of the region. The size and condition of these organs do in fact indicate the nature of the pasturage and the qualities of the water with which animals are supplied. No people can enjoy good health when subjected to the double influence of bad water and impure air.

Division of Water.— The simplest division of water is into two kinds, soft and hard. Rain, river, pond, and snow water is soft: well and spring water is generally hard. Soft water contains but little impurities, and when used for washing, forms a good lather with soap. Hard water contains at least one of the salts of lime, often more; mixed with soap, it curdles and turns white. The reason of this is, that the oily acids of the soap unite with the lime, and form a compound which the water will not dissolve. Such water is not suitable for domestic purposes.

Chemical Nature of Water.— Water contains, reckoning the elements of which it is composed in volumes, two volumes of hydrogen, and one volume of oxygen. These two gases, the unlearned reader

will please remember, are highly subtle bodies, *not visible to the eye*; and yet, when chemically united, they form a liquid which covers two-thirds the entire surface of the globe, — floating upon its bosom the navies and merchant ships of all nations, and by its unmeasured depths and vast breadths and sublime movements, fills the thoughtful mind with conceptions of creative Power, which words never attempt to express. Should the two gases which compose this vast body of water cease to love each other, and fall asunder, the first lighted taper would set the world on fire, and not a living being upon its surface could escape destruction.

Impurities in Water.—It is not surprising that a fluid with as great a solvent power as water, should often dissolve and hold in solution a great many impurities. In passing along through the earth, before it comes up in springs and wells, it is filtered through various mineral earths, and becomes contaminated accordingly. In running through beds of limestone, it takes up a little carbonate of lime. Salt-beds impart to it common salt (muriate of soda), while sulphur and other ores tinge it with salts of various kinds.

Water-Supply.—At the present time all large cities and most of the towns in this country are supplied with water for domestic purposes, either from ponds or lakes, or from artesian wells, of greater or less purity, but in almost all cases superior to the common well-water, so liable to contamination by cesspools and sewage. The result is that the health of the people has been materially improved, and fevers, particularly those of a typhoid type, have diminished both in prevalence and fatality. The decaying vegetable and animal matter, which formerly was washed into the soil, and percolated into and poisoned the wells, is now washed away by copious supplies of pure, fresh water.

Lead Pipes.—In cities, water is usually conveyed through the dwellings in leaden pipes,—a practice fraught with a danger, to avoid which various expedients have been devised. That lead does often become oxidized and impart its poisonous properties to water when long in contact with it, is a well-known fact. Let a number of persons drink every morning from the the first water drawn from the pipes, and a portion of them will be attacked with some form of lead disease. The pipes should be emptied every morning before using the water for domestic purposes, and then there is little danger. Tinned pipes have been found to be almost entirely free from danger of lead-poisoning.

Physical and Other Properties of Water.—Good water is without smell, is perfectly clear, and in the mouth has a soft and lively feel. When poured from one vessel to another, it should give out air-bubbles. Boiled and distilled waters have a vapid, flat taste. This is owing to their containing no carbonic acid gas or atmospheric

air,— these being driven off in the act of boiling and distilling. A hundred cubic inches of good river water contain about $2\frac{1}{4}$ of carbonic acid, and $1\frac{1}{4}$ of common air.

Carbonic acid is what gives to mineral, or soda water, its brisk, and even pungent taste. Without a portion of this acid and atmospheric air, water is perfectly insipid, and not fit to be used as a beverage. Hence, if it be boiled or distilled to clear it of earthy matters, we must expose a large surface of it to the air, and shake it, that it may re-absorb from the atmosphere what it has lost, and thus recover its taste.

Rain Water is the Result of Distillation on a large scale, and would be insipid, like other distilled water, only that, after being distilled off from the waters upon the surface of the earth, it recovers, while ascending as vapor, the carbonic acid and atmospheric air.

Fishes breathe the air as well as land-animals, and hence, lakes upon the tops of high mountains, where but little oxygen can be absorbed into the water from the air, are not inhabited by the finny tribes.

The Saltness of the Ocean is simply the accumulation of the saline substances washed out of the bowels of the earth.

The water which for thousands of years has been distilling off as vapor from the surface of the ocean is nearly pure. Being carried by the winds to the continents, it falls as rain, sinks into the earth, is filtered through mineral substances, comes to the surfaces in springs, is collected into rivers, and, with all its freight of mineral salts, is borne back to the ocean. Everything that water can dissolve, and carry down from the continents, finds a great depository in the ocean; and as this has no outlet, the accumulation must go on without limit. Rivers which flow into the ocean contain from ten to fifty grains of salts to the gallon,—composed chiefly of common salt, sulphate and carbonate of lime, magnesia, soda, potash and iron; and these are the constituents of sea-water.

Cleansing of Impure Water.—Impure waters should be cleansed before being used for domestic purposes. Distillation is the most perfect method of purification. Filtration through sand is a good method. It removes all suspended vegetable or animal matter, and all living animals. Boiling likewise kills all animals, and throws to the bottom carbonate of lime. It is this which constitutes the crust which lines tea-kettles in all regions where limestone exists.

Settlers in a new country should make it a prime object to find good water. This is of great moment. Their own health and the health of their posterity is dependent upon it. Any soil, good or bad, is not worth half price, if it yield impure water.

FOOD VALUES—DIETS

Nutritious Principles Illustrated

By Standardized Charts

Food should be selected for three reasons: first, for its ability to build up the tissues of the body and repair the waste; second, for its value as a fuel to yield heat and power, and third, from the point of view of economy, and in these days of increased costs, the latter is a most essential feature.

Food as a Building Material.—As we have seen, foodstuffs which act as tissue builders or repairers are classified as nitrogenous or protein. It is necessary, in a well balanced diet, to supply just the quantity of protein which will enable the body to do its allotted work and to restore whatever waste has taken place as a result of such labor. Any excessive protein over tissue repairing or building needs is either excreted as waste material, or burned up, thus adding to the work of the body. Normally, and in health, the average diet taken in 24 hours contains about 4 ounces of protein.

Food as an Energizer.—The carbohydrates (starch and sugar) and fats are the energy producers in the body. Muscle power and heat are forms of energy. The former is developed as the food is consumed, the latent energy in the food becoming active. During this process of transformation, heat or the other form of energy is given off. Excess of carbohydrate or fat is stored up in the body as surplus flesh which may or may not be used as reserve fuel. Food is never completely burned up in the body. When a person does no muscular work, except the natural functions of respiration, circulation, etc., all the energy leaves the body as heat; but during muscular work part of the energy is shown in the external work done. Energy given off as heat from the body when it is at rest, or as heat and work together during labor, exactly equals the latent energy of the material burned up in the body.

Food Economy.—The best food is that which is both most healthful and cheapest. The former depends on the proportions of nutrients and non-nutrients, and upon its ease and completeness of digestion, absorption and assimilation.

The cost of food is the principal item in the living expenses of most people. In solving the question as to which of the different food materials which are palatable, nutritious and otherwise suitable furnish the largest amount of available nutrients at the least cost, it is necessary to ascertain, not only the prices

of the different materials, but also the kind and amount of the actual nutrients they contain. The most economical food is that which is cheapest and at the same time supplies the most nutrient.

Four mistakes in food economy are commonly made: in that too costly kinds of food are used; the diet is one-sided; excessive quantities of food are eaten; or errors in cooking are permitted.

Calories—Right Feeding.—The selection of the proper quality and quantity of food is made at the present day by estimating its energy value in terms of Calories. A Calorie is simply a unit of heat measure, and, physiologically, means the amount of heat required to raise one pound of water 4 degrees Fahrenheit. A Calorie value of $15\frac{1}{2}$ grains of any food may be expressed in Calorie factors; e. g. Protein, 4.1 Calories; Carbohydrate, 4.1 Calories; Fat, 9.3 Calories. Normally, the average diet taken in 24 hours contains about—Protein 4 ounces equal to 492 Calories Carbohydrate, $16\frac{2}{3}$ ounces equal to 2,050 Calories, and Fat, $1\frac{4}{5}$ ounces equal to 465 Calories. Total number of Calories represented by such a daily diet is 3,007.

Method of Obtaining Nutrient and Caloric Values.—Reduce a given quantity of foodstuff to grams (1 oz.=32 grams).

Multiply this by per cent of protein, carbohydrate and fat in such a quantity.

Example (See Bread in Table, page 101):

4 ounces white bread=128 grams.

$128 \times 9.2\% = 11.78$ grams of protein.

$128 \times 53.1\% = 67.97$ grams of carbohydrate.

$128 \times 1.1\% = 1.41$ grains of fat.

To find Calorie value of this given quantity of foodstuff. Multiply actual amount of protein, carbohydrate and fat by appropriate Calorie factor.

Example (see above):

11.78×4.1 (protein Calorie factor) = 48.30 Calories

67.97×4.1 (carbohydrate Calorie factor) = 278.68 “

1.4×9.3 (fat Calorie factor) = 13.11 “

Calorie value of 4 ounces bread = 340.09 “

Quantity of Food.—Provided the amount of each article of foodstuff eaten in 24 hours is known, the total nutrient and Calorie value of such a diet can be determined. Or, a daily diet can be prescribed which can, by this method, be made to furnish the desired amount of protein, carbohydrate and fat, and the Calorie value determined, bearing in mind that the average amount in health is accepted as being protein, 120 grams; carbohydrate, 500 grams; fat, 50 grams, representing about 3,000 Calories.

The following tables are taken from the Government Report just published

AVERAGE COMPOSITION AND VALUE OF ORDINARY FOOD

I. ANIMAL FOOD

	Refuse Per cent	Water Per cent	Protein Per cent	Fat Per cent	Carbo- hydrates Per cent	Ash Per cent	Calories per pound
BEEF, fresh:							
Chuck ribs	16.3	52.6	15.5	15.0	....	0.8	910
Flank	10.2	54.0	17.0	19.0	....	.7	1,105
Loin	13.3	52.5	16.1	17.5	....	.9	1,025
Porterhouse steak	12.7	52.4	19.1	17.9	....	.8	1,100
Sirloin steak	12.8	54.0	16.5	16.1	....	.9	975
Neck	27.6	45.9	14.5	11.9	....	.7	1,165
Ribs	20.8	43.8	13.9	21.2	....	.7	1,135
Rib rolls . . . . .	....	63.9	19.3	16.7	....	.9	1,055
Round	7.2	60.7	19.0	12.8	....	1.0	890
Rump	20.7	45.0	13.8	20.2	....	.7	1,090
Shank, fore	36.9	42.9	12.8	7.3	....	.6	545
Shoulder and clod	16.4	56.8	16.4	9.8	....	.9	715
Fore quarter	18.7	49.1	14.5	17.5	....	.7	995
Hind quarter	15.7	50.4	15.4	18.3	....	.7	1,045
BEEF, corned, canned, pickled and dried:							
Corned beef	8.4	49.2	14.3	23.8	....	4.6	1,245
Tongue, pickled	6.0	58.9	11.9	19.2	....	4.3	1,010
Dried, salted and smoked	4.7	53.7	26.4	6.9	....	8.9	790
Canned boiled beef . . . .	....	51.8	25.5	22.5	....	1.3	1,410
Canned corned beef . . . .	....	51.8	26.3	18.7	....	4.0	1,270
VEAL:							
Breast	21.3	52.0	15.4	11.0	....	.8	745
Leg	14.2	60.1	15.5	7.9	....	.9	625
Leg cutlets	3.4	68.3	20.1	7.5	....	1.0	695
Fore quarter	24.5	54.2	15.1	6.0	....	.7	535
Hind quarter	20.7	56.2	16.2	6.6	....	.8	580
MUTTON:							
Flank	9.9	39.0	13.8	36.9	....	.6	1,770
Leg, hind	18.4	51.2	15.1	14.7	....	.8	890
Loin chops	16.0	42.0	13.5	28.3	....	.7	1,415
Fore quarter	21.2	41.6	12.3	24.5	....	.7	1,235
Hind quarter with- out tallow	17.2	45.4	13.8	23.2	....	.7	1,210
LAMB:							
Breast	19.1	45.5	15.4	19.1	....	.8	1,075
Leg, hind	17.4	52.9	15.9	13.6	....	.9	860
PORK, fresh:							
Ham	10.7	48.0	13.5	25.9	....	.8	1,320
Loin chops	19.7	41.8	13.4	24.2	....	.8	1,245
Shoulder	12.4	44.9	12.0	29.8	....	.7	1,450
Tenderloin . . . .	....	66.5	18.9	13.0	....	1.0	895

	Refuse Per cent	Water Per cent	Protein Per cent	Fat Per cent	Carbo- hydrates Per cent	Ash Per cent	Calories per pound
PORK, salted, cured and pickled:							
Ham, smoked . . .	13.6	34.8	14.2	33.4	....	4.2	1,635
Shoulder, smoked .	18.2	36.8	13.0	26.6	....	5.5	1,335
Salt pork . . . .	....	7.9	1.9	86.2	....	3.9	3,555
Bacon, smoked . .	7.7	17.4	9.1	62.2	....	4.1	2,715
SAUSAGE:							
Bologna	3.3	55.2	18.2	19.7	....	3.8	1,155
Pork . . . . .	....	39.8	13.0	44.2	1.1	2.2	2,075
Frankfort . . . .	....	57.2	19.6	18.6	1.1	3.4	1,155
SOUPS:							
Celery, cream of .	....	88.6	2.1	2.8	5.0	1.5	235
Beef . . . . .	....	92.9	4.4	.4	1.1	1.2	120
Meat stew . . . .	....	84.5	4.6	4.3	5.5	1.1	365
Tomato . . . . .	....	90.0	1.8	1.1	5.6	1.5	185
POULTRY:							
Chicken, broilers .	41.6	43.7	12.8	1.4	....	.7	305
Fowls	25.9	47.1	13.7	12.3	....	.7	765
Goose	17.6	38.5	13.4	29.8	....	.7	1,475
Turkey	22.7	42.4	16.1	18.4	....	.8	1,060
FISH:							
Cod, dressed . . .	29.9	58.5	11.1	.2	....	.8	220
Halibut, steaks or sections	17.7	61.9	15.3	4.4	....	.9	475
Mackerel, whole .	44.7	40.4	10.2	4.2	....	.7	370
Perch, yellow, dressed	35.1	50.7	12.8	.7	....	.9	275
Shad, whole . . .	50.1	35.2	9.4	4.8	....	.7	380
Shad, roe . . . .	....	71.2	20.9	3.8	2.6	1.5	600
FISH, preserved:							
Cod, salt	24.9	40.2	16.0	.4	....	18.5	325
Herring, smoked .	44.4	19.2	20.5	8.8	....	7.4	755
FISH, canned:							
Salmon . . . . .	....	63.5	21.8	12.1	....	2.6	915
Sardines	5.0	53.6	23.7	12.1	....	5.3	950
SHELLFISH:							
Oysters, "solids" .	....	88.3	6.0	1.3	3.3	1.1	225
Clams . . . . .	....	80.8	10.6	1.1	5.2	2.3	340
Crabs	52.4	36.7	7.9	.9	.6	1.5	200
Lobster	61.7	30.7	5.9	.7	.2	.8	145
EGGS: Hens' eggs . .							
	11.2	65.5	13.1	9.3	....	.9	635
DAIRY PRODUCTS, etc.:							
Butter . . . . .	....	11.0	1.0	85.0	....	3.0	3,410
Whole Milk . . . .	....	87.0	3.3	4.0	5.0	.7	310
Skim milk . . . .	....	90.5	3.4	.3	5.1	.7	165
Buttermilk . . . .	....	91.0	3.0	.5	4.8	.7	160
Condensed milk . .	....	26.9	8.8	8.3	54.1	1.9	1,430
Cream . . . . .	....	74.0	2.5	18.5	4.5	.5	865
Cheese, Cheddar . .	....	27.4	27.7	36.8	4.1	4.0	2,075
Cheese, full cream .	....	34.2	25.9	33.7	2.4	3.8	1,885

II. VEGETABLE FOOD

	Refuse Per cent	Water Per cent	Protein Per cent	Fat Per cent	Carbo- hydrates Per cent	Ash Per cent	Calories per pound
FLOUR, meal, etc.:							
Entire wheat flour	11.4	13.8	1.9	71.9	1.0	1,650	
Graham flour	11.3	13.3	2.2	71.4	1.8	1,645	
Wheat flour, patent roller process —							
High grade and medium	12.0	11.4	1.0	75.1	.5	1,635	
Low grade	12.0	14.0	1.9	71.2	.9	1,640	
Macaroni, vermicelli, etc.	10.3	13.4	.9	74.1	1.3	1,645	
Wheat breakfast food	9.6	12.1	1.8	75.2	1.3	1,680	
Buckwheat flour	13.6	6.4	1.2	77.9	.9	1,605	
Rye flour	12.9	6.8	.9	78.7	.7	1,620	
Corn meal	12.5	9.2	1.9	75.4	1.0	1,635	
Oat breakfast food	7.7	16.7	7.3	66.2	2.1	1,800	
Rice	12.3	8.0	.3	79.0	.4	1,620	
Tapioca	11.4	.4	.1	88.0	.1	1,650	
Starch . . . .	....	....	....	90.0	....	1,675	
BREAD, Pastry, etc.:							
White bread	35.3	9.2	1.3	53.1	1.1	1,200	
Brown bread	43.6	5.4	1.8	47.1	2.1	1,040	
Graham bread	35.7	8.9	1.8	52.1	1.5	1,195	
Whole wheat bread	38.4	9.7	.9	49.7	1.3	1,130	
Rye bread	35.7	9.0	.6	53.2	1.5	1,170	
Cake	19.9	6.3	9.0	63.3	1.5	1,630	
Cream crackers	6.8	9.7	12.1	69.7	1.7	1,925	
Oyster crackers	4.8	11.3	10.5	70.5	2.9	1,910	
Soda crackers	5.9	9.8	9.1	73.1	2.1	1,875	
SUGARS, etc.:							
Molasses . . . .	....	....	....	70.0	....	1,225	
Candy . . . .	....	....	....	96.0	....	1,680	
Honey . . . .	....	....	....	81.0	....	1,420	
Sugar, granulated . . . .	....	....	....	100.0	....	1,750	
Maple syrup . . . .	....	....	....	71.4	....	1,250	
VEGETABLES:							
Beans, dried	12.6	22.5	1.8	59.6	3.5	1,520	
Beans, lima, shelled	68.5	7.1	.7	22.0	1.7	540	
Beans, string	7.0	83.0	2.1	.3	6.9	.7	170
Beets	20.0	70.0	1.3	.1	7.7	.9	160
Cabbage	15.0	77.7	1.4	.2	4.8	.9	115
Celery	20.0	75.6	.9	.1	2.6	.8	65
Corn, green (sweet) edible portion	75.4	3.1	1.1	19.7	.7	440	
Cucumbers	15.0	81.1	.7	.2	2.6	.4	65
Lettuce	15.0	80.5	1.0	.2	2.5	.8	65
Mushrooms		88.1	3.5	.4	6.8	1.2	185
Onions	10.0	78.9	1.4	.3	8.9	.5	190
Parsnips	20.0	66.4	1.3	.4	10.8	1.1	230
Peas (Pisum sativum) dried	9.5	24.6	1.0	62.0	2.9	1,565	
Peas (Pisum sativum) shelled	74.6	7.0	.5	16.9	1.0	440	
Cowpeas, dried	13.0	21.4	1.4	60.8	3.4	1,505	

	Refuse Per cent	Water Per cent	Protein Per cent	Fat Per cent	Carbo- hydrates Per cent	Ash Per cent	Calories per pound
Potatoes	20.0	62.6	1.8	.1	14.7	.8	295
Rhubarb	40.0	56.6	.4	.4	2.2	.4	60
Sweet potatoes	20.0	55.2	1.4	.6	21.9	.9	440
Spinach	...	92.3	2.1	.3	3.2	2.1	95
Squash	50.0	44.2	.7	.2	4.5	.4	100
Tomatoes	...	94.3	.9	.4	3.9	.5	100
Turnips	30.0	62.7	.9	.1	5.7	.6	120
VEGETABLES, canned:							
Baked beans . . . . .	....	68.9	6.9	2.5	19.6	2.1	555
Peas (Pisum savi- tum) green . . . . .	....	85.3	3.6	.2	9.8	1.1	235
Corn, green . . . . .	....	76.1	2.8	1.2	19.0	.9	430
Succotash . . . . .	....	75.9	3.6	1.0	18.6	.9	425
Tomatoes . . . . .	....	94.0	1.2	.2	4.0	.6	95
FRUITS, berries, etc., fresh:							
Apples	25.0	63.3	.3	.3	10.8	.3	190
Bananas	35.0	48.9	.8	.4	14.3	.6	260
Grapes	25.0	58.0	1.0	1.2	14.4	.4	295
Lemons	30.0	62.5	.7	.5	5.9	.4	125
Muskmelons	50.0	44.8	.3	....	4.6	.3	80
Oranges	27.0	63.4	.6	.1	8.5	.4	150
Pears	10.0	76.0	.5	.4	12.7	.4	230
Persimmons, edible portion . . . . .	....	66.1	.8	.7	31.5	.9	550
Raspberries . . . . .	....	85.8	1.0	....	12.6	.6	220
Strawberries	5.0	85.9	.9	.6	7.0	.6	150
Watermelons	59.4	37.5	.2	.1	2.7	.1	50
FRUITS, dried:							
Apples . . . . .	....	28.1	1.6	2.2	66.1	2.0	1,185
Apricots . . . . .	....	29.4	4.7	1.0	62.5	2.4	1,125
Dates	10.0	13.8	1.9	2.5	70.6	1.2	1,275
Figs . . . . .	....	18.8	4.3	.3	74.2	2.4	1,280
Raisins	10.0	13.1	2.3	3.0	68.5	3.1	1,265
NUTS:							
Almonds	45.0	2.7	11.5	30.2	9.5	1.1	1,515
Brazil nuts	49.6	2.6	8.6	33.7	3.5	2.0	1,485
Butternuts	86.4	.6	3.8	8.3	.5	.4	385
Chestnuts, fresh	16.0	37.8	5.2	4.5	35.4	1.1	915
Chestnuts, dried	24.0	4.5	8.1	5.3	56.4	1.7	1,385
Cocoanuts	48.8	7.2	2.9	25.9	14.3	.9	1,295
Cocoanut, prepared . . . . .	....	3.5	6.3	57.4	31.5	1.3	2,865
Filberts	52.1	1.8	7.5	31.3	6.2	1.1	1,430
Hickory nuts	62.2	1.4	5.8	25.5	4.3	.8	1,145
Pecans, polished	53.2	1.4	5.2	33.3	6.2	.7	1,465
Peanuts	24.5	6.9	19.5	29.1	18.5	1.5	1,775
Pinon (Pinus edulis)	40.6	2.0	8.7	36.8	10.2	1.7	1,730
Walnuts, black	74.1	.6	7.2	14.6	3.0	.5	730
Walnuts, English	58.1	1.0	6.9	26.6	6.8	.6	1,250

	Refuse Per cent	Water Per cent	Protein Per cent	Fat Per cent	Carbo- hydrates Per cent	Ash Per cent	Calories per pound
MISCELLANEOUS:							
Chocolate.....		5.9	12.9	48.7	30.3	2.2	2,625
Cocoa, powdered....		4.6	21.6	28.9	37.7	7.2	2,160
Cereal, coffee, infusion (1 part boiled in 20 parts water).....		98.2	.2	....	1.4	.2	30

Sample Menu.—Below we append a menu for three meals for one day. This may be varied as desired, bearing in mind to keep the proportions of Calories the same.

BREAKFAST (871.27 Calories)

FRUIT.—One orange ($\frac{1}{2}$ lb.)	75.00
CEREAL.—Oatmeal ($\frac{1}{3}$ cup)	150.00
With whole milk ($\frac{1}{2}$ cup)	77.50
With sugar ($\frac{1}{32}$ lb.)	54.68
EGGS.—Two ($\frac{1}{5}$ lb.)	127.00
BREAD.—Two slices (12 slices to 1 lb. loaf)	200.00
BUTTER.— $\frac{1}{24}$ lb.	142.01
COFFEE.—One coffee cup full	.94
With cream ($2\frac{1}{2}$ teaspoons)	16.80
With sugar ($\frac{1}{64}$ lb.)	27.34

MID-DAY MEAL (1,142.98 Calories)

SANDWICHES.—Bread 4 slices (12 slices to 1 lb. loaf)	400.00
Beef (Rib roast) $\frac{1}{16}$ lb.	189.17
CAKE.—One slice (10 slices to 1 lb.)	163.00
COFFEE.—Two cups (16 oz.)	1.13
With milk ($\frac{1}{4}$ cup)	38.75
With sugar ($\frac{1}{32}$ lb.)	54.68
FRUIT.—One apple ($\frac{1}{4}$ lb.)	296.25

EVENING MEAL (984 Calories)

MEAT.—Corned Beef ($\frac{1}{3}$ lb.)	376.00
VEGETABLES.—Potatoes, 2 boiled ($\frac{2}{3}$ lb.)	316.00
Side of Peas, Onions, etc.	67.00
DESSERT.—Bread Pudding (1 serving)	145.00
TEA.—One cup with milk and sugar	80.00

Total Calories for day 2,998.25

Other menus will be furnished subscribers on application to the Publishers.

Rest and Sleep.

OUR bodies are like clocks; they run down and are wound up once every twenty-four hours. Were they obliged to work on uninterruptedly, they would wear out in a few days. It is a merciful provision that periods of repose are allotted to us. Everything has its

proper place. Rest is not less a luxury after exercise, than exercise is after rest. They both confer happiness at the same time that they promote our well-being.

Sleeping Rooms.—The largest part of our rest is taken in sleep. Of course the kind of room in which we sleep is worthy of consideration. Hufeland says: "It must not be forgotten that we spend a considerable portion of our lives in the bed-chamber, and consequently that its healthiness or unhealthiness cannot fail to have a very important influence upon our physical well-being." It should at least be large. That is of prime importance, because, during the several hours that we are in bed, we need to breathe a great deal of air, and our health is injured when we are obliged to breathe it several times over. We should at least pay as much attention to the size, situation, temperature, and cleanliness of the room we occupy during the hours of repose, as to the parlors, or drawing-room, or any other apartment. And yet how different from this is the general practice of families. The smallest room in the house is commonly set apart for the bed and its nightly occupants.

The sleeping-room should have a good location, so as to be dry. It should be kept clean, and neither be too hot nor too cold. And, more important still, it should be well ventilated.

One bed, occupied by two persons, is as much as should ever be allowed in a single room; though, of course, two beds in a large room are no more than one in a small one. Both are objectionable.

Fire in Sleeping Rooms.—As to having fire in a sleeping room, that is a matter to be determined by the health of the occupant. Persons who have poor circulation, and are feeble, had better have a little fire in the bed-chamber in cold weather. For those in good health a cold room is preferable.

Open Windows in Sleeping Rooms.—In the hot weather of summer, it is better to keep the windows open to some extent, through the night, but not on opposite sides of the room so as to make a draft across the bed.

There is a difference of opinion as to the safety of this practice, but the experience of those who have used it prudently and perseveringly has generally sanctioned its employment. It is presumed that night-air is made to be breathed; and if we breathe it habitually, there is no good reason why it should be considered hurtful. At all events we have got to do one of three things,—either breathe it, or be poisoned by air which is breathed several times over, or use very large sleeping rooms, and then lay in a stock to last over night.

An Open Fireplace in a bed-chamber will do much towards its purification. It carries off foul air. But many persons board up this outlet as if bad air were a friend with whom they could not think of parting. At the same time they will carefully close all windows and doors, as if fresh air were an enemy not to be let in.

Beds.—It is a pleasant thought that while so many things which injure health are coming into fashion, some which have a like effect are going out. Among the injurious things which are silently withdrawing are feather-beds.

In earlier times, a bed made of eider-down was thought to be a great luxury, to be carefully preserved, and handed down from mother to daughter. Beds made of hen's feathers, and other coarser kinds, were thought to be only fit for children. With due deference to these earlier judgments, it must be said that feather beds, whether downy or coarse, are not even fit for children. They are composed of animal matter, and by a slow process of decay, are always, when stirred, sending up an exhalation which it is not healthful to breathe.

By their softness, too, they increase the general tendency to effeminacy. In warm weather they are too heating. To sink down into them, and lie nearly buried all night, is to insure a feeling of lassitude and debility in the morning. Only the strongest persons can endure it without being made conscious of the evil effects.

Beds must not be too Hard.—On the other hand, it is almost equally unwise to choose a bed of absolutely unyielding hardness. When very tired, we may rest even upon a board; but sleep will generally be more sound as well as refreshing, if the bed be somewhat yielding. The hair mattress is the very best bed yet used. It is healthful and easy. No person once accustomed to it will ever return to feathers. In summer, it is a luxury; in winter, it is sufficiently warm, though a little more covering is needed than with feathers.

Bedding.—In hot weather, linen sheets are preferable to cotton, and of course will be used by those who have ample means. But cotton ones are good enough, and in winter are decidedly the more desirable of the two. Cotton is best, too, for those who suffer with rheumatic affections. For external covering, comforts are objectionable, because they do not let the insensible perspiration pass off as freely as it should. They are light, however, and so are rose blankets, which have the additional good quality of being porous. We should sleep under as few clothes as possible, consistently with comfort.

Night-Dress.—The flannel, cotton, linen, or silk, worn next the skin through the day, should always be replaced, on retiring, by a suitable night-dress. The undershirt should be of the same material with that which is taken off, but thinner. If we wear flannel through the day, we need it quite as much at night.

Do not Cover the Face.—The practice of sleeping with the face entirely covered with the bed-clothes is very injurious. It compels one to breathe the air over several times.

Natural Position for Sleep.—The most natural position in which to sleep is upon the right side. This affords the easiest play to the

internal organs. It is best, however, to learn to sleep in different positions, and to change occasionally from side to side. Upon the back is not so easy a position. To lie in this way obstructs the circulation of the blood, by the pressure of the stomach, bowels, etc., upon the large blood-vessels which pass down and up in front of the backbone. *It is very tiresome and injurious to lie with the hands above the head.*

Amount of Sleep. — The average amount of sleep required by persons in health is from seven to eight hours. Occasionally we find persons who get along very well with six, or even five hours; while some, even in health, require nine. There is no absolute standard for all persons, in the amount of sleep, any more than in that of food. It depends on the temperament, the constitution, the amount of exercise, and the exhausting nature of the mental application.

The object of sleep is to repair the energies, the extent to which they are wasted, and the recuperative power possessed, will measure the amount required.

Late Suppers. — These are a bar to all sound and healthful sleep. The last meal should always be taken at least three hours before retiring and should be light. During sleep the stomach should have a chance to rest. It will work the better on the morrow. Some persons boast that they can sleep perfectly well after a heavy supper. Perhaps they can, but, as Franklin has wisely suggested, they may by and by “have a fit of apoplexy, and sleep till doomsday.” This will be sleeping *too well!*

Preparation for Sleep. — Dr. Franklin left behind the record of a wise life, as well as many excellent moral and philosophical directions. A good conscience was his prescription for quiet sleep and pleasant dreams, — a most excellent direction. Sleep is promoted, too, by withdrawing the mind, a short time before retiring, from all hard study and exciting themes of conversation, and turning it to calmer subjects of reflection, such as the moral attributes of God, and particularly his love and paternal character.

Objects of Clothing.

THE clothes we wear are intended, or should be intended, to secure three objects, — *warmth in winter, coolness in summer, and health at all times.*

It has already been shown that our bodies are warmed by their own internal fires. In the lungs, in the skin, and indeed in all parts of the body, oxygen unites with carbon and other combustible matters, producing heat in the same way that it is produced in a grate where coal is burned; and as our temperature always needs to be kept to about 98° Fahrenheit, it follows that this combustion must always be going on.

Now, the atmosphere which surrounds us is always receiving into itself the heat which comes to the surface of our bodies, and thus robbing us of our warmth. In summer, the atmosphere, full of the rays of a burning sun, may impart heat, instead of taking it away; while in winter it takes more than it gives, and would cause us to perish with the cold, were it not for the protection afforded by our clothing.

Clothes, of course, have no power to manufacture or impart heat. They only retain, and keep in contact with our bodies, that which is generated within us. If we have on a single garment which is made tight at the bottom and top, so that no current can pass up or down, there will be a layer of air between it and the body, which, becoming immediately heated, and being retained there, helps keep us warm, or rather, prevents us from being cold. With every additional garment put over this, there is another layer of heated air, adding still more impenetrable guards against either the intrusion of cold, or the escape of internal heat.

Bad Conductors of Heat.—But, that our clothes may thus retain our warmth, and prevent its dispersion, they must be *bad conductors of heat*,—that is, they must not readily take up the heat and convey it away from the body. They must slowly absorb the caloric into their own substance, and then retain it tenaciously.

Linen, which is so universally popular in temperate climates, as an article to be worn next the skin, is unfortunately a good conductor of heat. It does not afford a warm garment. It conducts heat

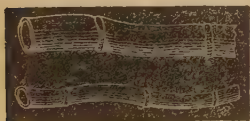


FIG. 67.

rapidly away from the body. Hence it always feels cool to the touch. It is really no colder in itself than other kinds of cloth, but it is solely the rapidity with which it conducts heat away from the body, that gives it the feeling of coldness. It has other qualities which compensate, in some measure, for this defect. The fibres of which it is composed are round and pliable, which makes linen cloth smooth and soft, and the sensations produced by it on the skin altogether agreeable. Fig. 67 represents a fibre of linen, as it appears under a microscope which magnifies it 155 times.

Cotton is warmer than linen, because it is a *worse conductor* of heat. The perfection to which its manufacture has been carried, makes it almost a rival of linen in softness and pliability. It does

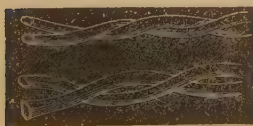


FIG. 68.

not absorb as much moisture as linen, and therefore better retains its powers as a non-conductor. But then the fibres of cotton are not round and smooth, like those of linen, but flat and spiral, with sharp edges. Fig. 68 represents two of its fibres, magnified 155 times. This renders cotton irritable to some very delicate skins. This is the reason why linen

is better than cotton for binding up wounds, where there is tenderness of the surface.

Silk has a round fibre, like linen, which is even softer and smaller. It absorbs less moisture than cotton, and in its power of retaining warmth, it is superior to both the preceding. It forms the most desirable fabric for clothing that we have; but its cost makes it inaccessible to the great body of the people, except as a holiday dress for the ladies. Its culture in our country, if extensively established, would be a source of national wealth.

The Fibre of Wool is quite rough, almost scaly, and highly irritative to delicate skins. Fig. 69 shows fibres magnified 310 times. It is not possible for some persons to wear it next the skin. But where this cannot be done it may be worn outside the linen or cotton; and being a good *non-conductor*, it will in this way preserve the warmth of the body, without either irritating the skin, or disturbing its electricity.



FIG. 69.

Wool, in cold climates, is one of the very best materials of which clothes can be made. In New England, and, indeed, in all cold and temperate regions, it should be worn by delicate persons, in the form of thick or thin garments, all the year round. It does not readily absorb moisture, and is a dry, warm, and wholesome material for clothing.

Hair.—Though not precisely in the line of these remarks, *hair* may as well be introduced here. Wool is in fact hair. Every part of the skin, with the exception of that upon the soles of the feet, and the palms of the hands, is intended to produce hairs. On most parts of the body, they are short and fine, hardly rising above the surface. Upon the head and the face, they grow to considerable length.

Hair, like wool, is a bad conductor of heat; and, as growing upon the head and face, is doubtless intended for some useful purpose. That it was designed as a warm covering, can hardly be doubted. The beard, when permitted to grow, is a natural respirator, guarding the lungs against cold and dust. It has been noticed that blacksmiths who have allowed their beards to grow, had their mustache discolored by iron-dust, which lodged among the hairs, and very justly inferred that the dust must have found its way into the lungs, and done mischief, had it not been arrested by this natural respirator.

That the beard, when long, does ward off a great many colds and throat troubles, is too well known to be denied. It has required moral courage on the part of those who have broken away from the universal practice of shaving, for which they should be honored rather than ridiculed. For those who do not suffer from throat or lung complaints, especially if they are getting advanced in life, it may not be thought worth while to abandon the razor. Yet the change would

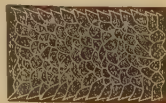


FIG. 70.

not be regretted. Fig. 70 is a human hair, magnified 250 times, showing its scaly surface.

The Color of our Clothing is a matter of some moment. The dark colors absorb the light, the sun's rays, and heat, much more than the lighter ones; and as those bodies which absorb heat well are likewise good radiators, the *dark colors have the highest radiating power*. White reflects heat and rays of light, and is a bad absorber and bad radiator. In summer it prevents the sun's rays from passing inward to heat the body, and in winter, interrupts the heat of the body in its passage out. In summer, it makes the coolest garment; in winter the warmest one. These facts can be very simply illustrated, by laying, side by side, upon the snow, when the sun shines, two pieces of cloth, the one black, the other white. Lifting them up, after a time, the snow will be found considerably *melted under the black cloth, but not under the white*.

It is now seen that the object of clothing is not to impart heat to the body, but to prevent its loss; that it is not to create it, but to furnish the occasion for increasing its degree. It appears further, that clothing protects the body against the evil effects of changes of temperature, and that white garments, by reflecting, instead of absorbing heat, guard it against the heat of summer.

Clothing should be Porous.—All articles used for garments should be *porous*, and permit the free passage of insensible perspiration. The skin receives oxygen through its pores, and gives back carbonic acid. It performs a sort of subordinate respiration. India-rubber garments, worn next to it, interrupt this, and must do mischief. Shoes made of this material soon cause the feet to become damp and cold. The dampness is occasioned by the insensible perspiration, which cannot escape through the rubber. Such shoes worn in the open air, should be immediately taken off on entering the house.

Thin Shoes.—The defective way in which American females protect their feet from cold and wet, is a sore evil; and he who persuades them to adopt a wiser fashion, and cover their feet with better guards against colds and consumption, will deserve the gratitude of the nation. We are in many things too fond of copying foreign fashions: but if our ladies would, in this matter, follow the excellent example of English women, they would live longer, and leave a hardier posterity behind them.

The shoes worn by our females, high and low, rich and poor, are not thick enough to walk with safety upon a painted floor, hardly upon a carpet in an unwarmed room; and yet they walk with them upon cold brick sidewalks, upon damp and frozen ground, and even in *mud*.

The result is, that they suffer from colds, sore throats, pleurisies, lung-fevers, suppressions, inflammations of the womb, and many other ailments, which in early life rob them of their freshness and beauty.

of their health and comfort, of their usefulness to their household and the world, and leave them helpless in the arms of their friends, with a patrimony of suffering for themselves while they live and a legacy of disease to hand down to their children. Would that they were wise in season! Some, to their honor be it said, have already adopted a safer course. It is hoped the evil will be gradually corrected.

Never attempt to mould the Form by Dress.—Parents commit a great error when they attempt to mould the forms of their children, particularly their daughters, by their dress. This cannot be done. It is the work of nature, and she wants no assistance in it. The great object of dress in childhood, as well as in adult life, is to promote health. *With this*, there is not much difficulty in preserving the symmetry; *without it*, deformity is almost a matter of course.

The fact cannot be too often repeated, nor too seriously urged upon parents, that while the foundation of all graceful and just proportion of the different parts of the body must be laid in infancy, it cannot be done by tight bands, and ligatures upon the chest, and loins, and legs, and arms. Upon all these points, the garments of children should set easy, leaving the muscles at liberty to assume the fine swell and development which nothing short of unconstrained exercise can give. Could infants tell all the horrors they suffer from the restraints put upon them by tight dresses, it would make many a mother's heart bleed.

In these brief remarks, the principles are given which should guide us in the selection of our clothing. The intelligent reader will be able very easily to fill up the outline.

Bathing and Cleanliness.

ARISTOTLE calls cleanliness one of the half virtues; and Addison, in the *Spectator*, recommends it as a mark of politeness; and as analogous to purity of mind. Both in the Jewish and Mohammedan law, it is enforced as a part of religious duty. Its requirement as a prerequisite to christian communion would be wiser than the demands sometimes made. A dirty Christian may perhaps be found, but not among those who mean to be intelligent.

The importance of keeping the skin clean is not generally appreciated. The motive for cleanliness is often a lower and meaner one than should be allowed to have place in the mind. Many persons would be mortified to have their hands, or face, or neck dirty, who do not wash their whole body once a year. That they may appear well in the eyes of others, is the only motive with such for keeping clean.

Offices of the Skin.—If we look a little at the offices of the skin, we shall better understand the need of keeping it clean.

The skin is not merely a covering to protect us from the weather. It is a living structure, curiously wrought, with a large extent of surface, and having important duties to perform in the animal economy. Its *structure* is more particularly explained under the head of "Anatomy" and "Skin Diseases." It has been already said, that it helps the lungs in breathing. It does many other things on which the health is dependent.

Number of Perspiratory Tubes.—The skin performs several kinds of secretion,—that is, it separates several things from the blood,—one of which is the perspiration, or sweat. The sweat is formed in small glands, situated just under the skin, and is brought to the surface in small ducts, or tubes, like the hose through which firemen throw water. These little tubes are spiral, as seen in cut 44, and run up through the two skins.

These spiral canals are very numerous, covering every part of the human frame,—there being about 2800 of them upon every square inch throughout the body; and as a man of ordinary size has about 2500 square inches of surface, the number of tubes in the skin of one man is *seven millions*.

The mouths of these tubes are called the *pores of the skin*. Each one of these tubes is extended just below the skin; and there, among the cells where the fat is deposited it, or rather the two branches into which it is divided, is wound into a coil, called the sudoriferous or sweat gland. These ducts are each about a quarter of an inch in length, which make an aggregate length of tubing in the human skin of about twenty-eight miles.

Insensible Perspiration.—Through each of these seven million of quarter-inch hose, there is poured out, day and night, as long as a man lives, a stream of sweat in the form of vapor. When this is thrown off very rapidly, as happens when active exercise is taken, it accumulates in drops, and is called sweat. Ordinarily it does not thus accumulate; it is then called insensible perspiration,—not being recognized by the senses.

This transpiration may be proved very beautifully by inserting the naked arm into a long glass jar, and closing up the space around it at the mouth so that no air can get in. The inside of the glass will soon be covered with a vapor, which will grow more and more dense until it is converted into drops. Boerhaave says: "If the piercing chill of winter could be introduced into a summer assembly, the insensible perspiration being suddenly condensed, would give to each person the appearance of a heathen deity, wrapped in his own separate cloud."

Now, this continual exudation of sweat through these millions of tubes is for a wise and necessary purpose. It is to take out of the blood and other fluids various salts, which would do mischief if allowed to remain longer, and particularly carbonic acid, which is

poisonous, — the same matters, in fact, which are thrown out by the lungs. The skin, in truth, is a kind of helper of the lungs; and a lady, by covering herself with garments which have no pores, and will neither admit air nor let off insensible perspiration, may be strangled almost as certainly as by putting a cord around her neck, and closing her windpipe. Almost twice as much fluid passes off through the skin as through the lungs.

Keep the Pores Open. — It is obvious from what has now been said, that the pores of the skin should be kept open to preserve health. When bathing is neglected, and the undergarments are not changed sufficiently often, the insensible perspiration accumulates and dries up upon the skin, mingling with the oily matter secreted by the oil-glands, and with the shreds of the scarf-skin, and forming a tenacious gluey matter, which closes up the pores. By this misfortune, that large quantity of worn-out matter which usually goes off with the fluid through the pores is retained to poison and embarrass the living current of blood, or seek an outlet through lungs or kidneys, which are already burdened with quite as much as they are able to do. How important, then, that these channels through which the body is purified should be kept open! that the skin should be kept healthy and in working order!

The Bath, the Great Purifier. — But this can only be done by daily washing. The bath is the great purifier of the human skin.

The antiquity of bathing is very great. The practice is supposed to reach back to the infancy of the race, or certainly to a very early period. The inhabitants of Middle Asia are said to have been the first to use the bath for the specific purposes of purification and health. Domestic baths are represented as having been used by Diomed and Ulysses. Andromache prepared warm water for Hector on his return from battle. Penelope banished sorrow by unguents and baths.

The Baths of the Medes, the Persians, and the Assyrians were much celebrated. Alexander, though familiar with the voluptuous baths of Greece and Macedon, was astonished at the magnificence of those of Darius.

Roman Baths. — As luxury and refinement advanced, the means of luxurious bathing were multiplied, until establishments were built by the Romans, the very remains of which excite wonder at this day. Among these are the *Thermæ* of Agrippa, of Nero, of Vespasian, of Titus, etc. One of the halls of the building constructed for baths by Diocletian, forms at this day the church of the Carthusians, one of the most magnificent temples in Rome.

Number and Character. — According to Pliny, baths were introduced into Rome about the time of Pompey; their first erection Dion attributes to Mæcenas. Agrippa increased their number to

one hundred and seventy; and within two hundred years they were multiplied to about eight hundred. These establishments were so vast that one writer compares them to provinces. They were paved either with crystal, or mosaic, or plaster, and were adorned by sculpture and painting to the very highest degree. They added not merely to the health and luxury of the people, but contributed to their culture in the highest departments of art and taste.

Names of Baths.—To the apartment of their dwelling in which they washed their bodies in warm or hot water, the Romans gave the name of *balneum*, or bath; to the public establishments, that of *balnea*, or baths. The apartment which held the vessels was called *vasarium*. In this were the three immense vessels which contained the cold, warm, and hot water. There were instruments of bone, ivory, and metal, for scraping the skin, with a groove in the edge, through which the impurities of the skin might run off.

On the north front of the *thermæ* was a reservoir of cold water large enough for swimming, called by Pliny the younger, *baptisterium*. In the centre was a spacious vestibule, and on each side, warm, cold, and vapor baths, with apartments for cooling, dressing, and refreshments. There was the *frigidarium*, a vaulted room, a cooling room midway between the warmer and the open air; the *tepidarium*, with a temperature midway between the above and the hot bath; and the *calidarium*, or the vapor bath.

Then there was the room where the body was rubbed over with a great number of ointments and essences of the most precious kinds; and another in which it was sprinkled over with powder; and also a room which held the clothes, in which the bathers undressed and dressed at pleasure.

All these apartments were double, the two wings being appropriated to the sexes.

Open to all.—These baths, thus numerous and magnificent, were open to all classes of the people, and contributed largely to the general health and physical endurance for which the Romans were conspicuous.

The Bath Neglected under the Christian System.—When Jesus of Nazareth came into the world, he found man's nature cultivated in a most defective way. The moral element had sunk down to the lowest place, while the physical had risen to the highest,—just the reverse of the true order of things. This Divine Teacher came, not to recommend a neglect of the body, but a new cure for the imperishable part. Mankind were for the first time systematically taught to forgive injuries. Prostrate liberty and degraded woman became the wards of Christianity.

Unfortunately, under the new order of things, the lower element of man, which had been exalted and worshipped, was cast down and abused. What the Pagan had pampered, the Christian persecuted.

The body, which had been bathed, and scrubbed, and anointed, and perfumed, was thenceforward, in consequence of the improper interpretation of certain texts, scourged, and fasted, and clothed in rags. Thousands believed, and thousands do to this day, that to torment the body is to please God. Under this feeling, the public and private baths were neglected, and to this day no Christian nation has fully appreciated the necessity of cleanliness, and of sanitary measures for the maintenance of the public health. To a considerable extent, the body is still under disabilities; still the subject of persecution; and where this is not the case, it is too often regarded only as a loose outside garment, to be thrown over the traveller to the celestial city, and is expected to be well soiled with mud and dust. The teachings of the Great Master will by and by cease to be perverted, and will be applied to raise up man's body, as they have raised his mental and moral nature, and will make a well-developed and harmonious being.

In the meantime, it is the duty and the privilege of the physician to urge a return, not to the magnificence of the ancient regimen for training the body, but to its real efficiency in a simpler form.

Cold Bathing.—Water applied to the skin at a temperature below 75° of Farenheit, is called a cold bath. If applied to a person with sufficient constitutional energy to bear it, it is a decided and very powerful tonic. By this is meant that it promotes the solidity, compactness, and strength of the body.

The first effect of the application of cold water to the skin, is the sudden contraction of all its vessels, and the retreat of the blood towards the internal organs. The nervous system, feeling the shock, causes the heart to contract with more energy, and throw the blood back with new force to the surface.

This rushing of the blood back to the skin, is called a reaction; and when it occurs with some energy, it is an evidence that the system is in a condition to be much benefited by the cold bath. When this does not take place, but the skin looks shrunk, and covered with "goose flesh," and a chilliness is felt for a longer or shorter time after bathing, then the inference should be, either that the water has been used too profusely, or that the bather has too little reactionary power for this form of the bath. The latter conclusion must not be accepted until cold water has been tried with all possible guards,—such as beginning with tepid water, and gradually lowering the temperature; bathing for a time, at least, in a warm room; beginning the practice in warm weather; and applying the water at first with a sponge out of which most of it has been pressed by the hand. With some or all of these precautions, most persons may learn to use the cold bath. It is always to be followed by brisk rubbing with a coarse towel or flesh-brush.

The Sponge Bath.—A wet sponge is the simplest, as well as the best mode of applying water to the surface of the body. With per-

sons who are feeble, a part only of the body should be exposed at a time, — which part, having been quickly sponged and wiped dry, should be covered, and another part exposed, and treated in a like manner. In this way, all parts of the body may successively be subjected to the bracing influence of water and friction, with little risk, even to the most delicate, of an injurious shock. The only furniture required for carrying out this simple plan of bathing, is a sponge, a basin, and a towel. There is no form of bathing so universally applicable as this, or so generally conducive to health.

The Shower Bath requires a brief notice. The shock to the nervous system produced by it is much greater than that from sponging. Beside the sudden application of coldness, there is a concussion of the skin by the fall of the water. This form of the bath is excellent for those who are strong and full of vitality, but is fraught with some danger for the feeble and delicate. This, however, depends on the judgment with which it is used. In the form of a delicate shower, and with tepid water, the frailest body might bear its shock.

The Warm Bath.— A temperate bath ranges from 75° to 85° ; a tepid bath, from 85° to 95° ; a warm bath, from 95° to 98° ; a hot bath from 98° to 105° . A warm bath is of the same temperature with the surface of the body. Of course it produces no shock. To those who are past the meridian of life, and have dry skins, and begin to be emaciated, the warm bath, for half an hour, twice a week, is eminently serviceable in retarding the advances of age.

It is a mistake to suppose the warm bath is enfeebling. It has a soothing and tranquillizing effect. It renders the pulse a little slower, and the breathing more even. If the bath be above 98° , it becomes a hot one, and the pulse is quickened.

The temperature of the warm bath, as of the cold, should be made to range up and down according to the vigor of the frame, and the circulation of the individual. The aged and the infirm, whose hands and feet are habitually cold, require it to be well up towards the point of blood heat. The pulse should not be made to beat faster by it, nor should sensations of heat or fullness be induced about the temples and face.

The Vapor Bath.— This differs from the warm bath in being applied to the interior as well as to the exterior of the body. The warmth is inhaled into the air-tubes at the same time that it envelops the external person. The first sensation of the vapor bath is oppression, and causes some difficulty of breathing; but this passes off as soon as the perspiration begins to flow. From the steam-chamber, the bather should step into a tepid bath, and after remaining a short time in this, wipe himself thoroughly with dry towels.

Cold Affusion immediately after either the warm or the vapor bath, is excellent. In Russia it is common, after the vapor bath, to pour

upon the head of the bather a bucket of warm water, then one of tepid, and lastly one of cold; and to finish with giving him a good towelling. It is even said that the natives leave the steam and the hot bath, and roll themselves in the snow.

No danger need be feared from cold affusion when the skin is red and excited by the warm bath, provided the nervous frame is not in a depressed condition. If the body is chilled, and the nerves prostrated by disease or fatigue, the application of cold water to the skin may do great mischief, and should in no case be hazarded. Cold water applied to a *hot* skin cannot do harm; to a *cold* skin, it can do nothing but harm. Hence, the cold bath may be used with advantage on rising in the morning, while the body is warm. Another good time is at ten or eleven o'clock in the forenoon, when the nervous power is advancing towards its height for the day.

Reaction Necessary.—As a means for promoting cleanliness, the importance of the bath can hardly be overstated. For the support and improvement of health, it is equally important. But for the promotion of the latter, one prerequisite is essential,—the reaction of the skin.

Various means are resorted to, to secure this. The Hindoos secure it by a kind of shampooing, thus described by a writer: "One of the attendants on the bath extends you upon a bench, sprinkles you with warm water, and presses the whole body in an admirable manner. He cracks the joints of the fingers, and of all the extremities. He then places you upon the stomach, pinches you over the kidneys, seizes you by the shoulders, and cracks the spine by agitating all the vertebræ, strikes some powerful blows over the fleshy and muscular parts, then rubs the body with a hair-glove until he perspires," etc. "This process," says the writer, "continues for three-quarters of an hour, after which a man scarcely knows himself; he feels like a new being." Sir John Sinclair speaks thus of the luxury of the process: "If life be nothing but a brief succession of our ideas, the rapidity with which they now pass over the mind would induce one to believe that in the few short minutes he has spent in the bath, he has lived a number of years."

The Coarse Towel, the horsehair glove, and the flesh-brush are the appliances commonly used for stimulating the skin, and causing reaction. For tender skins, the towel is sufficiently rough. With this the bather should rub himself, unless he is weak and the exertion produces palpitation. The muscular exertion necessary for this will help the reaction.

Restoration of the Bath desirable.—It is greatly to be wished that the bath might be restored to something like the importance it held among ancient nations. It is a luxury, a means of health, and a source of purity both of body and of mind; for the morals of any people will rise where the use of the bath is regular and habitual.

The attempt to cure all diseases by what is called the "water-cure," has a bit of fanaticism about it, which will cure itself in time. But that water, used judiciously in the form of baths, is a potent moral and physical renovator of the race, is not to be doubted; and this should commend it to all sensible people, even though it should sometimes be abused by excess, as all good things are.

Air and Ventilation.

Pressure of the Atmosphere.—The atmosphere presses upon man and upon every object on the surface of the earth, with a force equal to fifteen pounds to every square inch; and as a man of average size has a surface of about 2500 square inches, the air in which he lives presses upon him with a weight of eighteen tons. This would of course crush every bone in his body, but for the fluids within him which establish an equilibrium, and leave him unoppressed.

Deep Breathing.—The right lung is divided into three lobes, the left lung into two lobes (see page 40, also Manikin opposite page 60). These lobes are divided into millions of very fine air cells all of which should be filled with pure fresh air, many times a day, by deep breathing.

The best way to practice deep breathing is to stand by an open window, or better still, out of doors. Place the feet together, body erect, head thrown back. Place the hands upon the back of the hips, the thumbs about three inches apart. Then with the mouth closed inhale the air into the lungs to their fullest capacity. Then raise the arms stretching them forward slowly in front of you as in the act of swimming, at the same time allowing the air to pass slowly through the mouth until the lungs are absolutely free from air. Repeat this ten times in succession. Do it at least twice a day, morning and night.

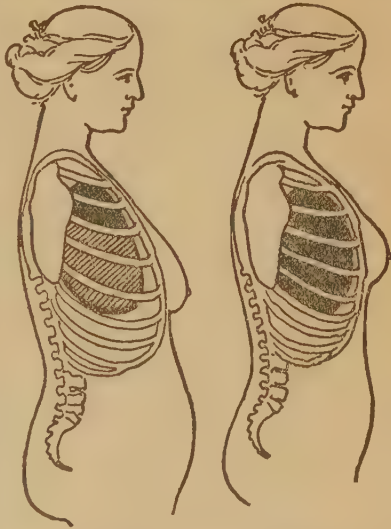


Fig. 1.

Fig. 2.

Figure 1 shows the breathing of the average person where only the upper lobes of the lungs are used, indicated in black, which causes the falling in or contraction of the chest and protruding of the abdomen.

Figure 2 shows the result of deep breathing utilizing every air-cell of the lobes of the lungs, which enlarges the chest and contracts the abdomen giving strength and vitality to the whole system.

The following chapter will explain the tremendous advantage to health derived from deep breathing.

Objects of Breathing.— There are at least three objects to be accomplished by breathing; the renewal of the blood and the taking of impurities out of it; the warming of the body; and the finishing up of the process of digestion, and the change of chyle into nutritive blood.

There is no good reason for attempting here to explain the last of these objects. To give any idea of the first two, it is necessary to furnish a very brief explanation of the circulation of the blood.

The heart is double. There are in fact two hearts, a right and a left, joined together. The right heart receives the blood from the veins, and forces it up into the lungs, whence it is brought back to the left heart, and by this is driven through the arteries into every part of the body. When received into the lungs, the blood is of a dark purple color, and is loaded with carbonic acid and some other impurities. It has also been deprived, during its circulation through the body, of most of its oxygen. The small, delicate vessels which convey this dark and impure blood through the lungs, pass directly over the air-cells; and at this moment the carbonic acid and water pass through the blood-vessels and air-cells, and are borne from the

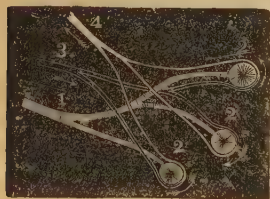


FIG. 71.

body on the outgoing breath; while the oxygen enters the blood through the walls of the same vessels; and this exchange, which takes place with every breath, alters the blood from a dark purple to a scarlet red. Fig. 71 shows at 1, a bronchial tube divided into three branches; 2, 2, 2, are air-cells; 3, branches of the pulmonary artery winding around the air-cells with the dark blood to be reddened.

That carbonic acid and water are borne out of the lungs with every breath, may be easily proved. If we breathe into lime-water, it will become white. This is owing to the carbonic acid in the breath uniting with the lime, and producing carbonate of lime. Then, if we breathe upon a piece of glass, it becomes wet, showing that there is watery vapor in the breath. That the blood receives oxygen from the air we breathe is proved by the fact that the ingoing breath has one-fourth more oxygen in it than the outgoing.

The lungs, then, take out of all the air we breathe, one-fourth of its oxygen. If we breathe it over a second, a third, and a fourth time, it not only has less oxygen each time, and is less useful for the purposes of respiration, but it becomes positively hurtful by reason of the poisonous carbonic acid which, at every outgoing breath, it carries with it from the lungs.

Effect of Sleeping in a Small Room.— Now, consider the effect of

sleeping in a small room, seven feet by nine, not furnished with the means of ventilation. A pair of lungs, of ordinary size, take in, at each breath, about a pint of air. Out of this air one-fourth of its oxygen is extracted; and when it is returned from the lungs, there comes along with it about eight or nine per cent of carbonic acid. As it is not safe to breathe air containing more than three or four per cent of this gas, the pint which the lungs take in and throw out at each breath is not only spoiled, but it spoils something more than another pint with which it mingles; and as the breath is drawn in and thrown out about eighteen times per minute, not less than four cubic feet of air is spoiled in that time by one pair of lungs. This is two hundred and forty feet an hour; and in eight hours, the usual time spent in the sleeping room, it amounts to one thousand nine hundred and twenty cubic feet. During the hours of sleep, therefore, one pair of lungs so *spoil* one thousand nine hundred and twenty cubic feet of air that it is positively dangerous to breathe it.

In a room seven feet by ten, and eight feet high, there are five hundred and sixty cubic feet of air, a little more than one-quarter the amount spoiled by one pair of lungs during sleeping hours. In a room of this size, there is not air enough to last one person three hours; and yet two persons often remain in such rooms eight or nine hours.

Why then do they not perish? Simply because no room is entirely air-tight. Fortunately, all our rooms are so made that some foul air will get out, and a little that is pure will find its way in. *Were it not so, no man who closed the door behind him, for the night, in a small bed-room, would ever see a return of day.*

Suppose fifty children are confined in an unventilated school-room, twenty feet by thirty, and ten feet high. These children will spoil about one hundred and fifty feet of air in one minute, or nine thousand feet per hour, or *twenty-seven thousand feet in three hours*,—a usual half-day's session. But the room holds only *six thousand cubic feet of air*,—*the whole of which these children would spoil in forty minutes.*

These simple facts show the absolute necessity of ventilation. Yet how poorly it is provided for in our sleeping rooms, our sitting rooms, our school houses, our churches, our court houses, our halls of legislation, and even in our anatomical and medical lecture-rooms!

In sick-rooms, ventilation should receive special attention.—Every disease is aggravated by the breathing of bad air. Yet it is common to close all the doors and windows of rooms where sick persons are confined, lest the patients should take cold. This is a bad practice. The sick should have plenty of fresh air. Their comfort is promoted by it, and their recovery hastened.

It is strange that human beings should be afraid of pure air. It is their friend and not their enemy. Impure air only should be shunned.

The supply of good air ample.—There is no necessity for breathing air which has lost a part of its oxygen, and acquired a portion of carbonic acid. The supply of good air is ample. An ocean of it forty-five miles deep, covering the whole globe, seems a pretty plain intimation that it is not to be sparingly used. When men retire within their dwellings, and attempt to shut out this great sea of air, they show about as much wisdom as would be exhibited by fishes which should build water-tight huts around themselves at the bottom of the ocean, and swim about continually in the unchanged water within. Fishes can live in glass globes only when the water is changed every day; and if the water be changed half a dozen times a day, they cannot be as healthy as when swimming in the great ocean.

Cultivating Trees.—In most of our cities there is almost a criminal neglect of the cultivation of trees; yet they add greatly to the health, and prolong the lives of the citizens.

The leaves of a tree are the lungs with which it breathes; but instead of extracting oxygen from the air, and giving back carbonic acid, like man, it takes only the poisonous carbonic acid, and gives back oxygen.

Were there no animals on the globe, the vegetables would consume all the carbonic acid, and die for want of breathing material; on the other hand, were there no trees or other vegetables, the animals would in time so far exhaust the oxygen as to perish for lack of it. The two together keep the air healthy for each.

The relation of plants and animals, in all that relates to their peculiar actions and effects, is a complete antagonism. Their movements are in contrary directions, and by hostile forces. Their opposing actions may be illustrated thus:—

THE VEGETABLE PRODUCES the non-nitrogenized substances, sugar, starch, and gum.

THE VEGETABLE DECOMPOSES carbonic acid, water, and ammoniacal salts.

THE VEGETABLE DISENGAGES OXYGEN.

THE VEGETABLE ABSORBS heat and electricity.

THE VEGETABLE IS A DE-OXIDIZER.

THE VEGETABLE IS STATIONARY.

THE ANIMAL CONSUMES the non-nitrogenized substances, sugar, starch, and gum.

THE ANIMAL PRODUCES carbonic acid, water, and ammoniacal salts.

THE ANIMAL ABSORBS oxygen.

THE ANIMAL PRODUCES heat and electricity.

THE ANIMAL IS AN OXIDIZER.

THE ANIMAL IS LOCOMOTIVE.

These simple facts should teach man the sanitary importance of trees and bushes; and wherever he has a rod, I had almost said a foot of ground to spare, a tree should be planted and carefully nursed. This is particularly necessary in large cities. Every narrow street in a city should be lined with trees. For their absence, thousands of men, women, and children have died sooner than they otherwise would. We want them stretching up their arms to all our windows to give us oxygen, and to take to themselves the carbonic acid we exhale.

TEMPERAMENTS
AND
CONSTITUTION of the BODY
AND
SYMPTOMS of DISEASES

It is necessary that the reader should understand the temperament
and constitution of the body and symptoms of diseases
that they may intelligently diagnose
the case.

TEMPERAMENTS, CONSTITUTION, AND SYMPTOMS.

MAN has *thinking, warming, nourishing, and moving* powers. For the performance of each of these great functions, he has organs of the best possible construction.

For Thinking, he has a *brain*. If this be *large in proportion to his other organs*, it gives a character, a cast, a peculiarity to his whole organization. Everything about him is subordinate to his brain. We recognize him, at once, as a thinking and feeling being. He has an intellectual *look*. There is a delicacy, a refinement, a sensitiveness, a studious habit, an air of thoughtfulness about him, which determine his traits, his tone, his temper, his whole character. Hence it is proper to say he has a *cephalic* or *thinking temperament*.

The Lungs and Heart, devoted to renewing and circulating the blood, are placed in the *chest or thorax*. If *these be large in man in proportion to other organs*, he is characterized by great activity of circulation, by a large supply of red blood, and by the general indications of a full, warm, and bounding life. This activity gives him his tone and temper, and shows that his is the *thoracic* or *calorific temperament*.

In the Great Cavity of the Abdomen is done the work of receiving, digesting, and disposing of the materials which nourish the body. If the organs which do this work *be large in proportion to others*, the body is fed to repletion, and the whole organization speaks of the table. The habit, the look, the temper, are all sluggish. This is the *abdominal* or *alimentary temperament*.

The Bones and Muscles are instruments by which the *movements* of the body are performed. If these be the largest, in proportion, of any in the body, then the locomotive powers are in higher perfection than any others. There is largeness of person, energy of movement, and greatness of endurance. The whole cast of the person partakes of the strength and coarseness of bone and muscle. This is the *muscular* or *locomotive temperament*.

This gives us four temperaments, as follows: —

I. The Cephalic Temperament, denoted by large brain, activity of mind, and general delicacy of organization.

II. The Thoracic Temperament, indicated by a large chest, force of circulation, redness of skin, great activity, warmth of temper, and fulness of life.

III. The Abdominal Temperament, denoted by a large development of the stomach, liver, bowels, and lymphatics; by a fulness of belly, fondness of high living, and a disposition to float sluggishly upon the current of the world, rather than to struggle against it.

IV. The Muscular Temperament, indicated by largeness of frame and limbs, coarseness of structure, and great power of locomotion and endurance.

There are some reasons for reckoning but three temperaments instead of four, by reducing the thoracic and abdominal to one, after the manner of the phrenological Fowlers, — especially as the organs in the chest, and their appendages, take an important part in the process of nutrition. But as the heart and lungs are placed in one cavity, and the stomach, liver, etc., in another, and as one set of these organs may be largely developed, and the other defectively, I have thought it most convenient, on the whole, and quite as philosophical, to retain the *four* temperaments.

These temperaments seldom or never appear single and pure. They mix and cross with each other in all possible ways.

Medication and Temperaments.

THE object of speaking of temperaments in this work is to make the reader acquainted with the principles upon which remedies are to be adapted to their development. The philosophical-minded physician will, in prescribing, always keep the temperament in view.

Persons of a Cephalic Temperament cannot bear powerful medicines, — particularly drastic purges. Their fine, delicate and sensitive organizations would be torn all to pieces by doses which would hardly be sufficient in a fully-developed muscular temperament. This should always be borne in mind in prescribing for persons of a large brain and delicate organization.

In this temperament, too, fevers, instead of running a high and fiery course, take the low typhoid type, the patient becoming pale, and showing a constant tendency to sink. Such patients would be killed by purging, leeching, cupping, sweating, and starving. They want tonics, stimulants, and every kind of support which the case will possibly permit.

Persons of a Thoracic Temperament, having a rapid circulation, and a fulness of blood, are most liable to inflammatory diseases. When fever attacks them, they have what is called a "high fever." If rheumatism comes, it is *acute* rheumatism. Disease takes hold of them *smartly*. As they do everything with emphasis and energy

when well, so, when ill, they make a business of it, and are sick with all their might.

Stimulants and tonics generally make such persons worse. They want sedatives, and diaphoretics, and sweats, and purgatives, and leeches, and cups, and low diet, and cold bathing, and whatever else will slacken the ferocious swiftness of their circulation.

Those of the Abdominal Temperament are not particularly subject either to very high fevers, or to those typhoid forms which produce sinking. As in the two temperaments noticed above, their complaints chiefly attack the organs most largely developed. Their diseases affect the stomach, the liver, the spleen, and the bowels. These are the largest organs in their bodies, and are most used; and, being overworked, they fall into disease.

As these persons are slothful in all their habits, so their diseases run a sluggish course. They are not so liable to sudden death as persons of either of the preceding temperaments. They have all sorts of *chronic* diseases which linger a great while, and are cured with much difficulty.

These persons will bear larger doses of medicine than either of the preceding. Neither do their constitutions respond as readily to medicine. A physician will be disappointed if he expects to see them recovering as fast under its use.

Those of a Muscular Temperament, having little fondness for anything but a hardy, active life, are much exposed to the elements. Though strong and long-enduring, the hardship of their lives often breaks them down, and when felled by disease, they are oftentimes shockingly racked and torn by it.

These persons bear large doses of medicine, and when sick, need to be treated with an energy proportioned to the strength of their constitution. Rheumatism, which affects the joints, the ligaments, and the tendons, is an affection from which they suffer severely.

The Constitution.

IN prescribing for disease, it is of very great importance to take notice of the constitution. This is a different matter from the temperaments. Persons of the same temperament are often quite unlike in the strength of their constitution. And those having good natural constitutions, frequently abuse them by improper habits and indulgences, and at length come to have broken and very feeble constitutions.

Some persons' muscles and other tissues are put together as if they were never intended to come apart. Like some of the woods of the forest,—the *lignum vitæ* for example,—they are fine-grained and tough. A real smart boy will wear out an iron rocking-horse sooner than one of these persons can exhaust their constitution by

hard work. Others, to outward appearance equally well made, have very little endurance, break down easily under hard work, and lose their flesh from trifling causes.

The state of the constitution, therefore, should always be learned before much medicine is given; for what a person of a strong constitution will *need*, may greatly injure a feeble person, even of the same temperament.

Habits.—These must likewise be attended to. Persons using stimulants require larger doses of medicine to affect them than other persons.

Climate.—Medicines act differently on the same persons in summer and winter. Narcotics act more powerfully in hot weather and climates than in cold, and must be given in smaller doses.

Idiosyncrasy.—Medicines of only ordinary activity, act very powerfully, and even violently on some persons. This is owing to a peculiarity of stomach, or constitution, called *idiosyncrasy*. It makes the person, in this particular, an *exception to the general rule*. And no physician can know beforehand in what particulars this exceptional disposition will show itself. Persons, however, learn their own idiosyncrasies, and should make them known to those who prescribe for them for the first time.

The Sex.—The peculiarities of each sex should never be forgotten in prescribing for the sick.

Males are not so sensitive as females. They will bear more medicine, and their nervous system is not so readily excited by it.

Influence of Age.—Human life is divided into *infancy*, *childhood*, *youth*, *manhood*, and *old age*. Each of these periods has peculiarities which modify disease.

The First Period, extending from birth to the age of seven years, is marked by tenderness and excitability, and is alive to every irritation. Teething and other disturbances occur at this period, and need careful management.

The Second Period extends from seven to fourteen, and is quite subject to disease, including the second dentition. During these two periods there is no great difference between the sexes; both are tender, and need careful watching.

During the Third Period, the changes occur which mark and separate the sexes. This is a developing period, when the functions become established, and the frame acquires form, proportion, and strength.

At this time, hereditary tendencies to disease, latent till now, begin to show themselves, and call for every possible endeavor to break them up, and fortify the constitution.

The Fourth Period embraces the vigorous maturity of life, when the powers of body and mind, in both sexes, are at the summit of their excellence. The functions are now well established. It is during this period that the female is subject to most of the harassing ailments peculiar to her sex. So numerous are these complaints, and so large and valued the class of persons affected by them, that he who treats them with the greatest skill, and with the delicacy which their nature demands, may be said to be at the head of his profession.

The Fifth Period is that of old age, when the functions are declining, and the frame is bending under the weight of years. Old age begins earlier with females than with males. Many ailments are common to this period, which require peculiar management, both medicinal and hygienic.

Proper Frequency of Dose.—Each succeeding dose should be given before the effect of the preceding is gone. If this rule is not attended to, the cure does not advance. What is gained by each dose is lost by the rallying of the disease in the interval. Care must be taken, however, not to apply this rule too strictly with very active medicines.

How to Examine a Patient.

WHEN a patient is presented for examination, having observed the temperament, constitution, sex, and age,

1. Learn the causes of the disease, whether local, specific, or general, and also its history.
2. Search out its nature and character, whether febrile or otherwise.
3. Take notice of the whole train of symptoms, — embracing the pulse, the condition of the mouth, tongue, and digestive organs, the breathing, the urine, the fecal discharges, the condition of the brain and nervous system, the state of the skin, etc.

Brief Table Explanatory of Symptoms.

GENERAL APPEARANCE OF PATIENT.

1. Tonic spasm of the trunk	indicates	Locked jaws.
2. Distorted features, altered position, and impaired motion of limbs	"	Paralysis of one side.
3. Irregular and perpetual motion	"	St. Vitus's dance.
4. Entire and absolute immobility	"	Catalepsy.
5. Great and unnatural boldness	"	Insanity or delirium.
6. Great and unusual languor	"	The beginning of an acute disease, or the progress of a chronic one.
7. Ability to lie only upon the back	"	Apoplexy. Organic disease of the brain or spinal marrow. Acute inflammation of the lining of the abdomen. Rheumatism of the joints.
8. Lying upon the face	"	Several kinds of colics.
9. Lying upon one side	"	Pleurisy, or inflammation of the lungs. When one lung only is affected in consumption, the patient generally lies on the diseased side.

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| 10. Maintaining the sitting posture only | indicates | Disease of the heart or lungs, which interferes with breathing. |
| 11. The head thrown back | " | Severe diseases of the larynx and wind-pipe. |
| 12. Restlessness and tossings | " | The beginning of acute inflammation. Fevers. Delirium, and acute mania. |
| 13. General enlargement of the body | " | Cell-dropsy. Emphysema from a wound of the chest. |

Head, Face, and Neck.

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|---|-----------|---|
| 1. Head bent to one side | indicates | Convulsions. Paralysis of one-half the body. Dislocation of bones of neck. |
| 2. Head increased in size | " | Swelling of glands of neck. |
| 3. Swollen scalp | " | Chronic hydropholus. Enlarged brain. |
| 4. Dull expression of face | " | Erysipelas. Small-pox. |
| 5. Full, red face, with blood-vessels of eyes injected | " | Typhoid fever. |
| 6. Pinched, contracted countenance | " | Swelling of heart. Congestion of brain. |
| 7. Pinched nose, sunken eyes, hollow temples, skin of forehead tense and dry, complexion livid | " | Acute inflammation of peritoneum. Exposure to severe cold. |
| 8. Wrinkles across the forehead | " | Chronic disease just before death. |
| 9. Wrinkles from forehead, vertically to root of nose | " | Excessive pain arising externally. |
| 10. A white line from inner angle of the eye to just below the cheek-bone | " | Distress, anxiety, and severe internal pain. |
| 11. White line from the upper border of the wing of the nose (ala nasi), curved to the outer margin of the orb of the eye | " | In children, a brain or nervous affection; in adults, abuse of the generative organs. |
| 12. The white line in children from angle of mouth to lower part of face | " | In consumption and wasting of flesh. The lower part of the line indicates disease of stomach; the upper part, some affection of upper part of bowel. When united with the white line named above, and with a drawing in of the cheek, fixed eyes, and a wan complexion, it implies worms. |
| 13. A white line external to the last two, in a semicircular direction towards the chin | " | An affection of the chest, with difficulty of breathing. |
| 14. Swelling of the face and eyelids | " | Chronic and obstinate disease in the chest or belly. |
| 15. Transient redness or flushing of face | " | Albumen in the urine. |
| 16. Hectic flush | " | Suffering from the monthly irregularity. |
| 17. Paleness of face | " | Consumption. Chronic affections. |
| 18. Dingy, white, or greenish face | " | Cold stage of fever. Acute inflammation. |
| 19. Yellow tint | " | Chronic diseases, especially Bright's disease, during recovery. |
| 20. A citron tint | " | A low and deficient state of blood. |
| 21. A bluish tint | " | Jaundice. |
| 22. Perpetual motion of eyelids | " | Cancerous disease. |
| 23. Forcible closure of eyelids | " | Poor circulation in the veins. Cholera. |
| 24. Eyelids remaining open | " | Typhus fever. Blue disease. |
| 25. Palsy of the upper lid | " | Mania and idiocy. |
| 26. Flowing of tears over the cheek | " | Intolerance or dread of light. |
| 27. Nostrils dilating forcibly and rapidly | " | Orbicularis palpebrarum. Paralysis of the muscle which closes the eye. |
| 28. Itching of nostrils in children | " | Injury of the third pair of nerves. |
| | | Obstruction of the lachrymal duct. |
| | | Difficulty of breathing. |
| | | Worms in the bowels. |

The Tongue.

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| 1. Surface of tongue covered with a layer of whitish, soft, mucous substance, which may partially be taken off with a scraper, also, clammy mouth | indicates | Derangement of stomach, or bowels, or both. |
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| 2. State of tongue as above, with clammy mouth, bitter taste, and fetid breath. | indicates | Acute dyspepsia. Asthma. |
| 3. Great load on tongue as above, which <i>peels off</i> , leaving the tongue smooth, red and tender | " | Severe cases of acute dyspepsia. |
| 4. Tongue slightly white from small white points, and sometimes covered with fur, like the fibres of coarse velvet | " | Chronic dyspepsia. Some affection of the liver, if the fur be yellow. |
| 5. Tongue pale, tumid, clean and very smooth | " | Chlorosis or green sickness. |
| 6. Tongue <i>furred</i> and <i>dry</i> | " | Violent local inflammation. Irritation in bowels. |
| 7. Tongue white and loaded, with much thirst | " | Inflammatory fever. |
| 8. As above at first, — afterwards clean, red, and dry | " | Protracted inflammatory fever. |
| 9. Tongue white and loaded, with dryness | " | Mild typhus fever. |
| 10. Tongue dry, parched, tender, and dark brown or black. Pushed out with great difficulty and trembling | " | Severer forms of typhus fever. |
| 11. Tongue loaded with white, through which numerous elongated, very red papillæ protrude their points | " | Scarlet fever. |

The Throat.

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| 1. Throat enlarged | indicates | The approach of puberty in females. |
| 2. Violent pulsation of carotid arteries | " | Acute mania. Inflammation of brain. Enlargement of heart, and dilation of right ventricle. Anemia. |
| 3. Pulsation of the nameless artery (arteria innominata) above the breast bone, and to the right of the windpipe. | " | Regurgitation from aorta. |
| 4. Circumscribed swelling about throat | " | Enlargement of glands. |

The Chest.

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| 1. General enlargement of one side of chest | indicates | Large effusion of water from pleurisy. |
| 2. Bulging at the base of a lung | " | Water from pleurisy settling to the bottom. |
| 3. Bulging at front upper part of chest | " | Emphysema. |
| 4. Bulging right hypochondrium (See Fig. 95) | " | Enlargement of liver. |
| 5. Bulging in region of heart | " | Water in heart-case. Enlargement of heart. |
| 6. Tumor where the third rib joins the breast-bone | " | Aneurism of the ascending aorta. |
| 7. Tumor between the base of the shoulder blade and the spine | " | Aneurism of the descending aorta. |
| 8. Depression or retraction of one side of chest | " | Consumption. Absorption of fluid, effused by pleurisy. |
| 9. Breathing increased in rapidity. Generally, in health, about twenty breaths are taken in a minute | " | Spasmodic asthma. |
| 10. Breathing diminished in rapidity | " | Pleurisy. Paralysis of respiratory muscles. Inflammation of lungs. Emphysema. Pneumothorax. Consumption. |
| 11. Jerking respiration | " | Spasmodic asthma. Obstruction in larynx and windpipe. |
| 12. Breathing with muscles of ribs only | " | Abdominal inflammation. Inflammation of diaphragm. |

The Belly.

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| 1. Increased size of belly | indicates | Dropsy. Wind in bowels. Inflammation of peritoneum. Obstruction in bowels. Hysteria. |
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| 2. Enlargement in epigastrium (Fig. 93) indicates | Hysteria. Cancer of stomach. |
| 3. Enlargement in hypogastrium (Fig. 95) " | Distension of bladder. Ovarian tumors. Accumulation of feces in bowels. |
| 4. Belly diminished in size | " Chronic dysentery. Lead colic. Also in most chronic diseases, |

Private Organs.

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|-------------------------------|-----------|------------------------------------|
| 1. Enlarged penis in children | indicates | Stone in bladder. Masturbation. |
| 2. Drawing up of testicles | " | Stone in kidneys. |
| 3. Enlargement of scrotum | " | Hydrocele. Hematocele. Sarcocoele. |

The Limbs.

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|-------------------------------|-----------|----------------------------------|
| 1. The limbs immovable | indicates | Paralysis. |
| 2. Limbs contracted and rigid | " | Softening of the brain. |
| 3. General swelling of limbs | " | Defective circulation of blood. |
| 4. Swelling of joints, | " | Rheumatism. Water in the joints. |
| | | White swelling. |
| 5. Limbs diminished in size | " | Paralysis. |

The Nervous System.

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|---|-----------|---|
| 1. Morbidly increased sensation | indicates | Acute inflammation of brain and spinal marrow. Fevers. Hysteria. |
| 2. Tensive pain | " | Phlegmonous inflammation. |
| 3. Dull, heavy pain | " | Enlarged internal organs. Internal tumor. Effusion of water into cavities lined with serous membranes. Felt in the loins previous to discharge from menstruation, and from piles. |
| 4. Smarting pain | " | Scarf-skin removed. |
| 5. Shooting, tearing pains | " | Neuralgia. Cancer. |
| 6. Boring pains | " | Constitutional syphilis. Rheumatism. |
| 7. Contusive pains. | " | Gout. Inflammation of periosteum. |
| 8. Itching. Sensation as of ants creeping over the skin | " | Bruises. Acute diseases. |
| 9. Exaltation of vision | " | Several diseases of the skin. |
| 10. Black flecks floating before the eyes | " | Ophthalmia. Inflammation of brain. Some nervous diseases. |
| 11. Painfully acute hearing | " | Affections of the brain and optic nerve. Dyspepsia. |
| 12. Dull hearing | " | Inflammation of brain. Hysteria. |
| 13. Increase of strength | " | Typhus fever. |
| 14. Debility | " | Delirium. Inflammation of brain. |
| 15. Trembling | " | Mania. |
| | " | Most diseases. |
| | " | Cold stage of fever. Nervous affections. Old age. Action on the system of lead, mercury, strong coffee, alcoholic drink, tobacco, opium. |
| 16. Rigidity of upper extremities | " | Softening of the brain. Infiltration of blood into the brain. Hysteria. |
| 17. Cramp | " | Pregnancy. Hysteria. Painters' colic. |
| 18. Temporary spasm | " | In convulsions of children. Some affections of the brain. |
| 19. Pain at extremity of penis | " | Stone in bladder. |
| 20. Pain in right shoulder | " | Congestion of liver. |
| 21. Pain in left shoulder | " | Disordered stomach. |
| 22. Exaltation of affections | " | Hypochondriasis. |
| 23. Loss of moral sensibility | " | Mania. Typhus fever. Masturbation. |
| 24. Exaltation of intellect | " | Melancholy. Sometimes indicates close of life. |

The Breathing.

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|------------------------|-----------|--|
| 1. Stiffness of chest | indicates | Cartilages turned to bone. Pleura hardened. Distortion from rickets. |
| 2. Pressure upon parts | " | Tumors. Dropsy of belly. |

3. Obstruction of air-tubes	indicates	Spasm of glottis. Spasm near the small ends of bronchial tubes. Mucus, etc., thrown out upon the inner surface.
4. Compression of lungs	"	Effusions in pleurisy. Water in chest. Air in substance of lungs. Aneurism and other tumors.
5. Pain in parts moved in breathing	"	Pleurisy. Inflammation of peritoneum.
6. Paralysis of muscles of chest	"	Injury of spinal marrow.
7. Spasm of muscles of chest	"	Locked jaw. Spasmodic asthma.
8. Deficiency of red blood	"	Anæmia, Chlorosis or green sickness.

The Cough.

1. Hollow and barking cough	indicates	Last stage of consumption. Chronic bronchitis. Some nervous affections.
2. Sharp, ringing cough	"	Croup.
3. Hoarse cough	"	Beginning of cold. Chronic laryngitis.
4. Wheezing cough	"	Asthma.
5. Belching cough	"	Some diseases of larynx.
6. Cough in paroxysms	"	Hooping cough. Hysteria.
7. Cough sounding harsh and concentrated when listening with the stethoscope.	"	Consumption. Inflammation of the lungs. Pleurisy. Enlargement of bronchial tubes.
8. Cough sounding hollow, when listening with the stethoscope, as though it came from a cavern.	"	Tuberculous cavity. Enlarged bronchial tubes.
9. Cough having a metallic or ringing sound when listening with the stethoscope.	"	Large tuberculous cavity.

The Expectoration.

1. Scanty expectoration	indicates	First stage of acute diseases of the lungs.
2. Copious expectoration	"	Decline of acute diseases of air-passages and lungs.
3. Watery expectoration	"	Beginning of bronchitis. Congestion of lungs. Vesicular emphysema.
4. Mucous expectoration	"	Bronchitis. Inflammation of lungs.
5. Expectoration of pus	"	Consumption. Third stage of inflammation of lungs.
6. Expectorated matter shaped like coin (nummular)	"	Tubercular consumption. Bronchitis of measles.
7. Muco-purulent, flocculent expectoration	"	Consumption far advanced.
8. Tubular expectoration	"	Plastic bronchitis. Pneumonia.
9. Whitish or greenish expectoration, that clings to the vessel	"	Acute affections of lungs, particularly bronchitis
10. Yellow expectoration	"	Chronic bronchitis. Other chronic affections of the lungs and throat.
11. Rusty expectoration	"	Inflammation of the lungs.
12. Putrid smell of expectoration	"	Gangrene of the lungs.
13. Faint and sweetish smell of expectoration.	"	Bronchitis. First stage of consumption.
14. Expectoration smelling like garlic	"	Broncho-pleural fistula.

Pain.

1. Dull, heavy, aching pain at the base of the chest	indicates	Acute bronchitis.
2. Soreness about the breast bone, and between the shoulders	"	Acute bronchitis.
3. Sharp, sudden, tearing pain below the nipple	"	Pleurisy.
4. Pain darting from front part of chest to between shoulder blades	"	Consumption.
5. Constant pain between the shoulders	"	Consumption. Green sickness. Other chronic diseases.

The Pulse.

1. Strong pulse, resisting compression by the finger	indicates	Inflammatory affections, especially of the substance of large organs, as the liver, etc.
2. Weak pulse, easily pressed down	"	Prostration from disease. Nervous and chronic affections. Fear. Diseases of women and children, and old persons.
3. Full pulse, as if the artery were increased in size	"	Congestion of brain. Apoplexy. Disease of heart.
4. Small pulse, opposite of full	"	Inflammation of stomach, bowels, bladder, etc. Hysteria, and other nervous affections.
5. Hard, sharp, contracted pulse, — vibrating like a cord under the finger	"	Inflammation of membranes. Active bleedings. Lead colic, etc.
6. Soft pulse, yielding readily to pressure	"	Affections characterized by debility.
7. Frequent pulse	"	Inflammatory diseases. Hemorrhages.
8. Slow pulse	"	Apoplexy. Sometimes in disease of heart.

Relating to Digestion.

1. Tongue trembling and dry, and diminished in size	indicates	Typhoid and other low fevers.
2. Voracious appetite	"	Pregnancy. Hysteria. Insanity. Sometimes in dyspepsia.
3. Diminished appetite	"	In most acute diseases.
4. Increased thirst	"	Acute affections of stomach and bowels.
5. Thirst gone	"	Cerebral disease, with coma.
6. Vomiting	"	Early pregnancy. Colic. Disease of brain. Inflammation of stomach. Hernia.
7. Pain increased by pressure	"	Inflammation of internal organs.
8. Pain relieved by pressure	"	Over-distension of bowels. Neuralgia. Colic.
9. Urgent desire to go to stool	"	Dysentery. Sometimes in diarrhœa.
10. Watery stools	"	Diarrhœa. Cholera.
11. Mucous stools, like white of egg	"	Chronic inflammation of colon.
12. Hard and lumpy stools	"	Constipation. Colic. Cancer of stomach.
13. Clay-colored stools	"	Deficiency of bile.
14. Yellow or dark-brown stools	"	Too much bile.
15. Dark-green stools	"	Bile from children after taking calomel.
16. Stools red, and streaked with blood	"	Dysentery.
17. Pitchy black stools	"	Melœna.
18. Stools pure blood, with no colic	"	Bleeding piles.
19. Stools like rice-water	"	Asiatic cholera.
20. Black stools	"	Iron taken in medicine.
21. Shreds of false membrane in stools	"	Dysentery. Diarrhœa. Worms.
22. Fat with stools	"	Diabetes. Consumption.
23. Fetid stools	"	Diseases attended by debility.

The Urine.

1. Diminished secretion of urine	indicates	Dropsy. Inflammatory and febrile diseases.
2. Retention of urine in the bladder	"	Paralysis. Typhoid fever. Hysteria.
3. Urine increased in amount	"	Diabetes. Cold stage of fevers. Hysteria. Various passions of the mind.
4. Red or yellow sand deposits in urine (uric acid)	"	Fevers. Acute Rheumatism. Consumption. Dyspepsia. Great indulgence in animal food.
5. White sediment in urine (earthy phosphates)	"	Depressed state of the nervous system, of serious import.
6. Oxalate of lime deposits in urine	"	Derangement of digestion.
7. Blood in urine	"	Bleeding of kidneys, etc.
8. Albumen in urine	"	Bright's disease.
9. Mucus in urine	"	Inflamed mucous membrane of urethra, bladder, etc.
10. Sugar in urine	"	Diabetes.

The Perspiration.

1. Profuse perspiration	indicates	Acute rheumatism. Decline of acute inflammations and fevers, being sometimes critical.
2. Diminished perspiration	"	Early stage of acute disease. Dropsy. Diabetes.
3. Night sweats	"	Consumption.
4. Sour-smelling sweat	"	Rheumatism. Gout.
5. Fetid smelling sweat	"	Some debilitating fevers.
6. Sweat with mouldy odor	"	Measles. Scarlet fever.
7. Smelling like ammonia	"	Typhoid fever sometimes.
8. Sweat having the odor of mice	"	Insanity.
9. Sweat smelling like rottenstone	"	Miliary.

The Temperature.

1. General heat of surface	indicates	Fevers.
2. External local heat		Inflammation.
3. Hot forehead	"	Headache.
4. Hot scalp	"	Disease of brain.
5. Skin of chest hot	"	Inflammation in chest.
6. Hands and feet hot.	"	Consumption.
7. Acid heat, burning the hand when applied	"	Typhus fever.
8. Chills	"	Beginning of fever.
9. Low temperature	"	Poor circulation.
10. Cold hands and feet	"	Nervous diseases. Dyspepsia. Impure state of the blood.

The Temperature of the Body.

THE use of the thermometer is an important addition to the means of making physical examination, and is one of the improvements in modern medicine.

It is intended to measure the heat of the body.

The best kind now in use is the self-registering.

The bulb of the instrument is to be placed in the warmest part of the body, and should be allowed to remain there for eight to ten minutes.

Some place it under the tongue; some in the axilla.

Sometimes it is necessary to introduce it into the rectum or vagina.

In these parts the temperature is a degree higher than in other parts.

The normal temperature of the body is from 98° to 99° Fahrenheit, in the great majority of persons.

Exceptionally it may be half or a whole degree either above or below this range.

The normal fluctuations are inconsiderable in comparison with the variations of disease.

The natural variations in health are as follows: The temperature is at its minimum at five o'clock A.M.; the maximum is reached in the latter part of the afternoon, and then decreases till five o'clock A.M.

By means of the thermometer we are able to determine all differences with precision.

The increase of heat in different febrile diseases rarely exceeds 110° Fahrenheit, and as a rule the amount of increase is a criterion of its severity.

An increase to 100° Fahrenheit or 101° is evidence of mildness of the disease.

If the thermometer indicates steadily 105° Fahrenheit, it is certain that the disease is severe.

A persisting temperature above 105° Fahrenheit denotes that there is great danger, and an increase to 108° to 110° Fahrenheit is usually a fatal sign.

The abnormal changes of temperature consist of more or less increase.

Diminution below the normal standard is comparatively rare; yet it sometimes occurs and is of some importance.

In the course of typhoid fever, a sudden decrease may indicate intestinal hemorrhage. Sometimes the temperature falls without improvement in the other symptoms. This is an unfavorable symptom.

The value of thermometric changes depends in no small measure upon the symptoms with which they are associated.

Sickness during Life.

It is estimated that 2 years' sickness is experienced by every person before they are 70 years old, and that 10 days per annum is the average sickness of human life. Till 40 it is half, and after 50 increases. The miscellaneous diet of man is the cause of many diseases.

Human Longevity.

Of 100,000 male and female children, in the first month of life they are reduced to 90,506 or nearly a tenth. In the second to 88,155. In the third to 85,976. In the fourth to 85,139. In the fifth to 84,122. In the sixth to 82,635, and by the end of the first year to 76,938, the deaths being 2 in 10. The next four years reduces the 76,938 to 63,048, indicating 36,952 deaths before the completion of the fifth year.

At 25 years the 100,000 are about half, or 49,695; at 55 about a third; at 59 about a fourth, or about 25,000; at 67 about a fifth; at 75, a tenth; at 80, a twentieth, or 5,000, and 10 attain 100 years.

About the age of 35 the lean man usually becomes fatter, and the fat man leaner. Again, between the years 45 and 50 is generally a critical time in a man's life, his appetite fails, he becomes logy, and tires easily upon the least exertion of body or mind. His muscles become flabby, his spirits droop and his sleep is poor and unrefreshing. After suffering under these complaints a year or two, he seems to acquire new vigor, and goes on to 62 or 63, when a similar change takes place, but when improvement comes he is apt to go on to a ripe old age.

Strength and Warmth Derived from Different Articles of Food and Drink.

Strength derived from articles of food and drink.

Grains of Strength yielded by one pound of 7,000 grains.

	Grains
Parsnips,	12
Turnips,	13
Whey,	13
Greens,	14
Potatoes,	24
Skimmed Milk,	35
New Milk,	35
Buttermilk,	36
Barley,	70
Rice,	70
Bacon,	78
Rye Bread,	89
Baker's Bread,	90
Fresh Pork,	109
Corn Meal,	125
Fresh Fish,	129
Cocoa,	130
Oatmeal,	140
Mutton,	140
Fresh Beef,	173
Beef Liver,	200
Split Peas,	250
Cheddar Cheese,	310
Skim Milk Cheese	361

Warmth derived from one pound of different articles of food

Grains of Warmth yielded by one pound of 7,000 grains.

	Grains
Whey,	151
Turnips,	238
Buttermilk,	335
Skimmed Milk,	352
New Milk,	378
Carrots,	390
Parsnips,	426
Potatoes,	770
Fresh Fish,	980
Beef Liver,	1,220
Red Herrings,	1,456
Baker's Bread,	1,990
Fresh Beef,	2,300
Molasses,	2,300
Skim Milk Cheese,	2,355
Seconds Flour,	2,700
Rye Bread,	2,700
Rice,	2,755
Barley Meal,	2,780
Indian Meal,	2,806
Sugar,	2,900
Fresh Pork,	3,100
Bacon,	4,201
Butter,	4,700
Lard,	4,806

The stature of the body at birth
and subsequent ages.

The additional length of life a person is expected to live after reaching the age of 20 years and each subsequent year to 70 years old.

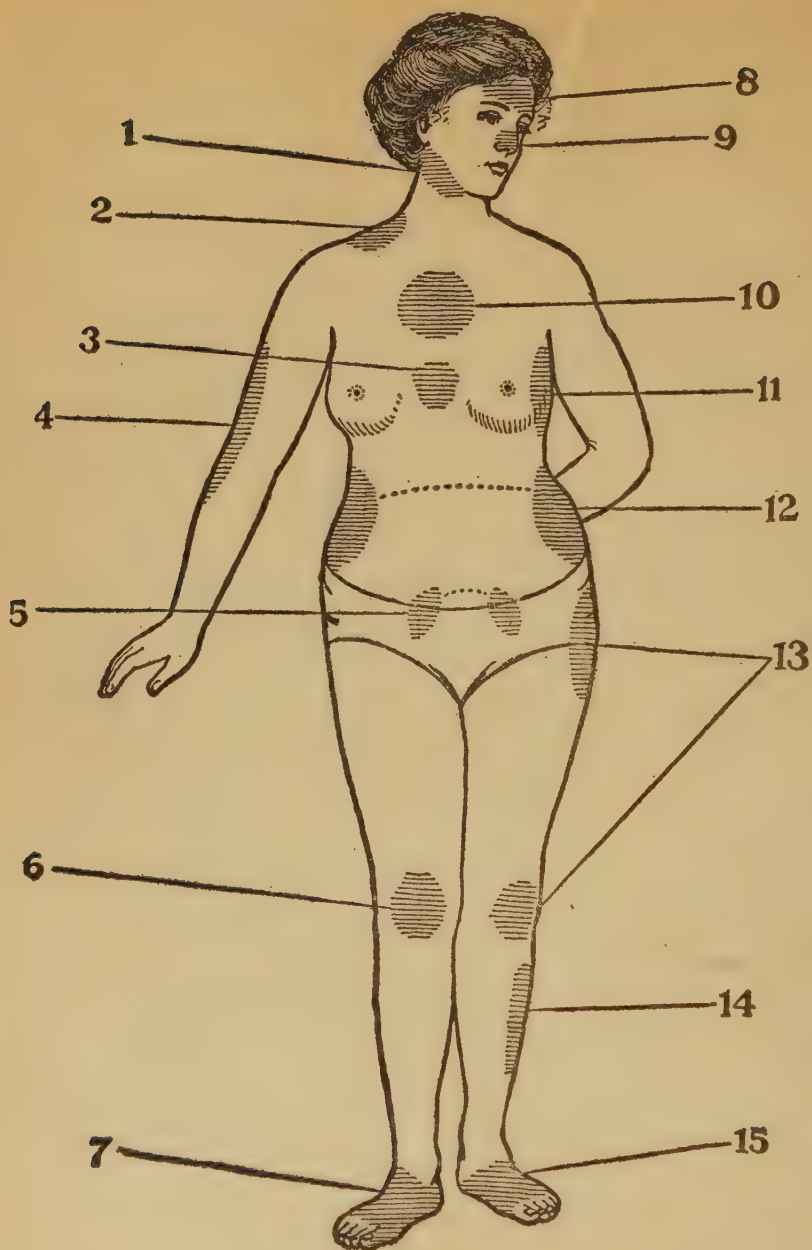
STATURE OF MALES			STATURE OF FEMALES			YEARS		YEARS	
Age	Feet	Lbs.	Age	Feet	Lbs.	Age	Expectancy	Age	Expectancy
0	1.65	7.05	0	1.63	6.42	20	41 $\frac{1}{2}$	46	24
2	2.60	25.02	2	2.55	23.53	21	40 $\frac{3}{4}$	47	23 $\frac{1}{4}$
4	3.05	31.38	4	3.01	28.67	22	40	48	22 $\frac{1}{2}$
6	3.44	38.81	6	3.38	35.29	23	39 $\frac{1}{2}$	49	22
9	4.01	49.95	9	3.93	47.10	24	38 $\frac{3}{4}$	50	21 $\frac{1}{4}$
11	4.36	59.78	11	4.26	56.57	25	38	51	20 $\frac{1}{4}$
13	4.73	75.81	13	4.61	72.65	26	37 $\frac{1}{4}$	52	19 $\frac{3}{4}$
15	5.08	96.40	15	4.92	89.04	27	36 $\frac{1}{2}$	53	19
17	5.36	116.56	17	5.10	104.34	28	35 $\frac{3}{4}$	54	18 $\frac{1}{4}$
18	5.44	127.60	18	5.15	112.55	29	35	55	17 $\frac{3}{4}$
20	5.50	132.46	20	5.16	115.30	30	34 $\frac{1}{2}$	56	17
30	5.52	140.38	30	5.18	119.82	31	33 $\frac{3}{4}$	57	16 $\frac{1}{4}$
40	5.52	140.43	40	5.18	121.81	32	33	58	15 $\frac{1}{2}$
50	5.50	139.96	50	5.05	123.86	33	32 $\frac{1}{2}$	59	15
60	5.38	136.08	60	4.98	119.76	34	31 $\frac{3}{4}$	60	14 $\frac{1}{2}$
70	5.32	131.28	70	4.97	113.60	35	31	61	14
80	5.29	127.55	80	4.95	108.80	36	30 $\frac{1}{2}$	62	13 $\frac{1}{2}$
90	5.28	127.54	90	4.94	108.81	37	29 $\frac{3}{4}$	63	13
						38	29	64	12 $\frac{1}{2}$
						39	28 $\frac{1}{4}$	65	11 $\frac{3}{4}$
						40	27 $\frac{3}{4}$	66	11 $\frac{1}{4}$
						41	27	67	10 $\frac{3}{4}$
						42	26 $\frac{1}{2}$	68	10 $\frac{1}{4}$
						43	25 $\frac{3}{4}$	69	9 $\frac{3}{4}$
						44	25 $\frac{1}{4}$	70	9 $\frac{1}{4}$
						45	24 $\frac{1}{2}$		

Weight of the Human Body.

THE weight of the male at birth is 7 lbs.; that of the female is about 6 $\frac{1}{2}$ lbs. The maximum weight (140 $\frac{1}{2}$ lbs.) of the male is attained at 40; that of the female (nearly 124 lbs.) is attained at 50. The full grown adult is 20 times as heavy as a new-born infant. In the first year he triples his weight. At an equality of age the male is heavier than the female. Towards the age of 12 years only, an individual of each sex has the same weight.

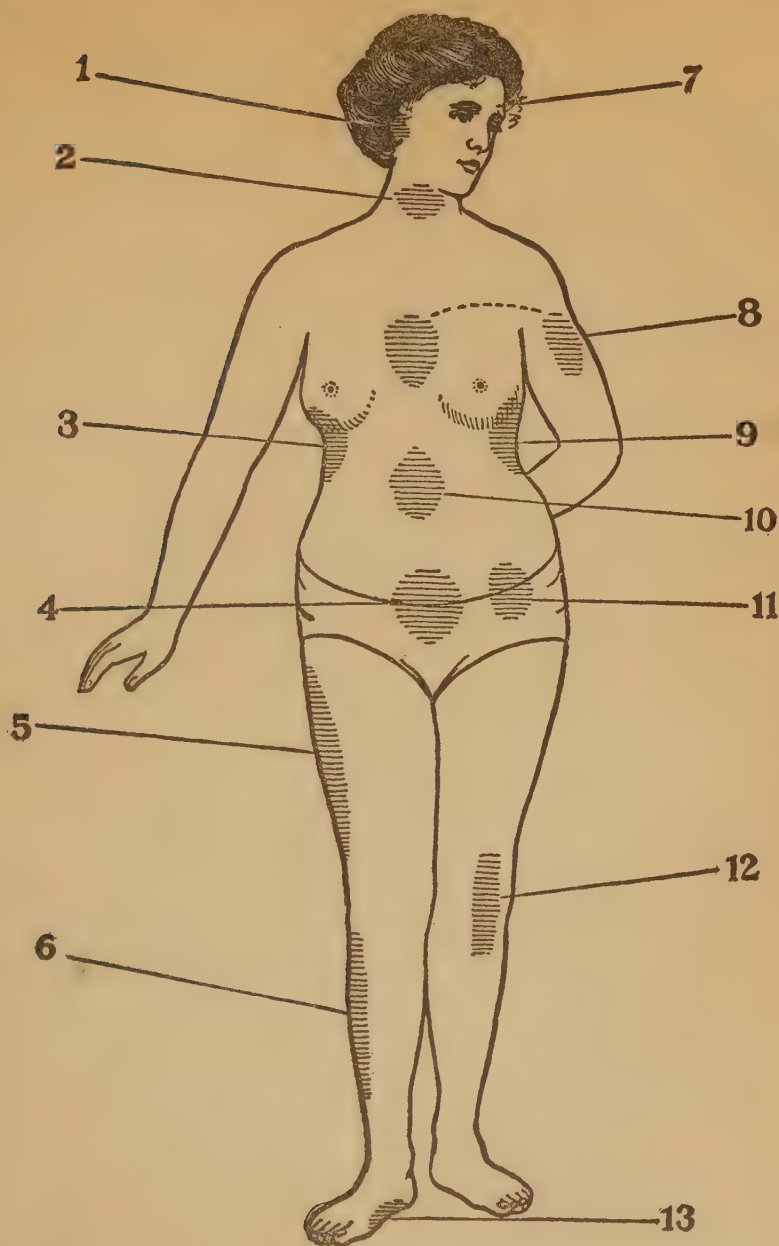
Children lose weight the first three days after birth; at the age of a week their weight gradually increases; after 1 year they triple in weight and require 6 years to double their weight, and 13 to quadruple it.

A Quick Diagnosis Diagram.



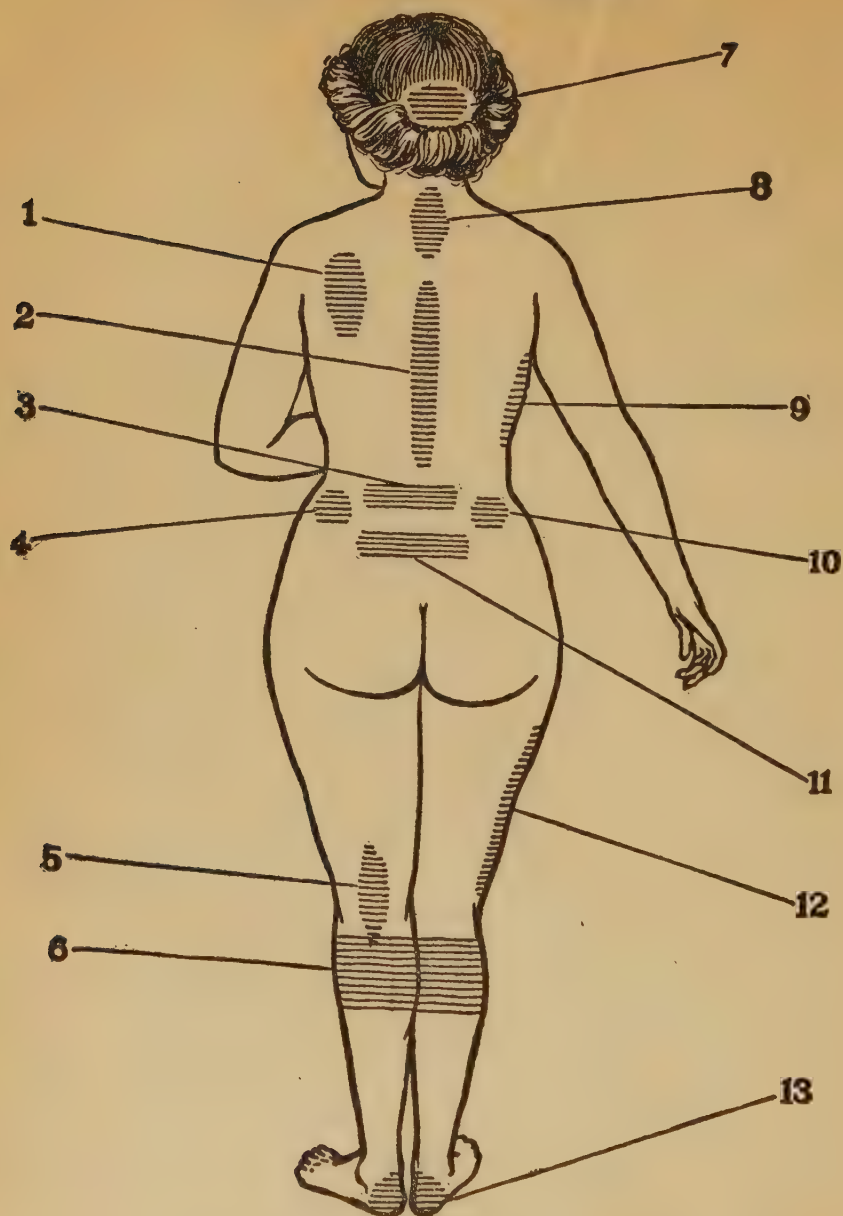
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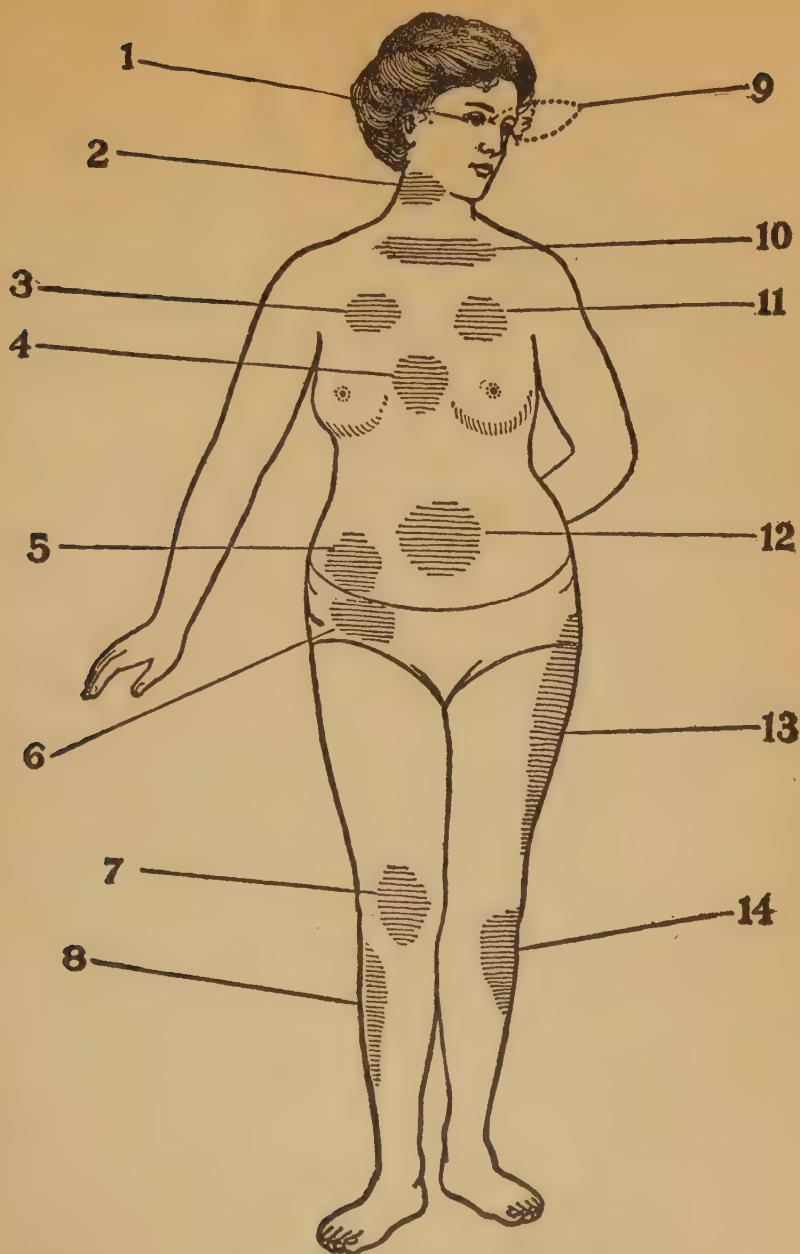
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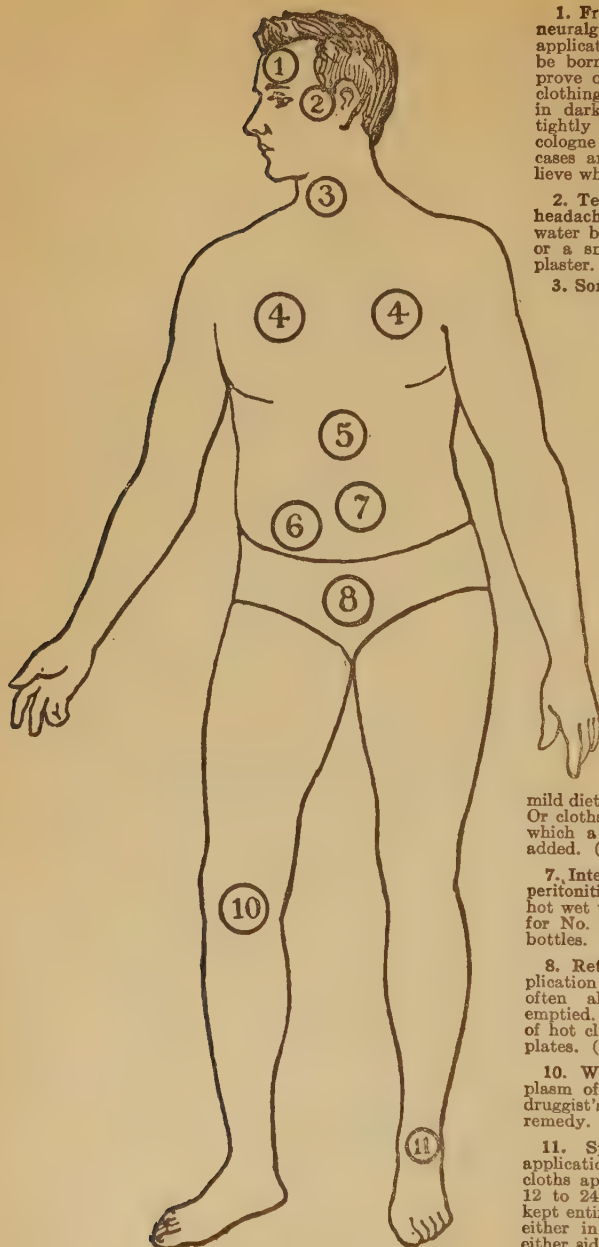
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A Quick Diagnosis Diagram.



1. Frontal headache, eye-strain, neuralgia, nervous headache.—The application of cloths as hot as can be borne, changing frequently, will prove of great service. Loosen the clothing about the neck, lie down in dark room. Or tie a bandage tightly about the forehead wet with cologne or camphor water. In some cases an ice bag or cold cloths relieve where warmth fails.

2. Temporal headache, congestive headache, earache.—Apply hot water bottle or hot hop or salt bag or a small size mitigated mustard plaster.

3. Sore throat, laryngitis, croup.—Wrap throat with cloth wrung out of very hot water (careful not to burn patient) and cover with large dry towel or flannel cloth. This is to steam throat.

4. Pneumonia, bronchitis, lung fever or congestion.—Large, hot flaxseed poultices applied constantly and changed when cold. When discontinued wipe dry and apply hot dry flannel to prevent taking cold. (See index.)

5. Colic or gastritis.—Mustard poultice or plaster applied to pit of stomach in conjunction with appropriate internal treatment. (See index.)

6. Appendicitis.—Hot flaxseed poultices applied constantly to this region with very mild diet and quietness of the bowels. Or cloths wrung out of hot water to which a little turpentine has been added. (See index.)

7. Intestina troubles, cold in bowels, peritonitis.—Hot flaxseed poultices, hot wet turpentine stupes as advised for No. 6, spice bags or hot water bottles.

8. Retention of Urine.—The application of heat at this point will often allow the bladder to be emptied. May be applied in form of hot cloths, hot water bag, or hot plates. (See index.)

10. Water on the Knee.—Cataplasm of kaolin, obtainable at any druggist's is the best and surest remedy.

11. Sprained ankle.—The first application should be cold wet cloths applied about ankle joint for 12 to 24 hours and later the joint kept entirely at rest for several days either in a pillow with splints on either side to retain the joint in one position or else the joint should be put in a plaster cast.

For Other Remedies for Above Diseases, See Index.

A Quick Diagnosis Diagram.

1. Headache, congestion of the base of the brain, occipital headache.—A hot water bottle or small mustard poultice applied to nape of neck in conjunction with hot foot baths, are efficient in these troubles.

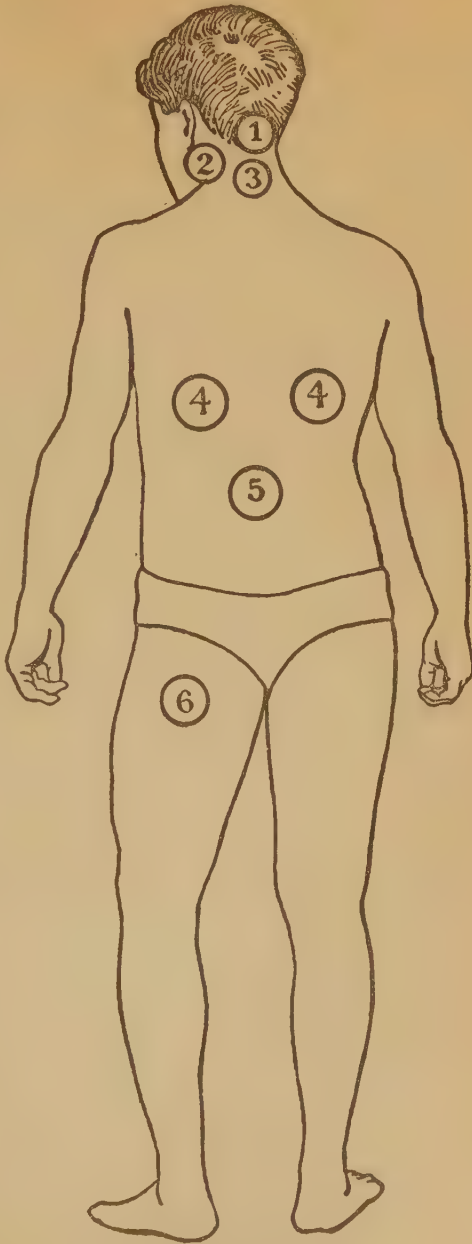
2. Stiff-neck, torticollis or wry neck.—Bathing with hot alcohol and water, or chloroform or ammonia liniments are useful applications.

3. Nose bleed (epistaxis).—Cold applications, as piece of ice or large cold key placed in position 3. Hold a wad of tissue paper between upper lip and teeth under nostril of bleeding side.

4. Pleurisy.—Paint with tincture of iodine for acute and chronic pleurisy though hot flaxseed poultices are possibly better for the very painful acute variety. Swathing the lower portion of the chest with firm bandages to prevent too deep breathing gives great relief.

5. Backache, lumbago.—Thorough massage of the back muscles in region of No. 5, using some bland and soothing oil like sweet or olive oil is excellent. Avoid irritating applications like mustard poultices but use porous plasters in their place or adhesive plaster straps.

6. Sciatica.—Painting course of sciatic nerve with tincture of iodine or the application of three or four fly blisters about three-fourths of an inch square, two or three inches apart, down the back.



For Other Remedies for Above Diseases, See Index.

SYMPTOMS

That quickly tell what your complaint is.

Backache.

Leucorrhœa. *Whites.*—Discharge from the vagina (catarrh) slight or profuse; thin, glairy; thick, lumpy or stringy; watery or milky; yellowish, greenish, bloody or purulent; odorless or offensive; bland or excoriating, with heat, burning and itching of genitals; headache; dizziness; backache; indigestion.

Displacement of the Uterus.—Weight in lower abdomen; pressing and bearing down sensations; disturbances of menstruation; backache.

Bowels.

Hernia. *Rupture.*—May be protusion of intestines in groin, which can be pushed back; or strangulated, when not reducible, with inflammation, pain, nausea, vomiting, constipation, cold sweat, anxiety, gangrene.

Colic, Intestinal.—Paroxysms of severe, twisting or boring pain, centering about navel, radiating through abdomen, better from friction and pressure; abdomen usually distended; may be cold sweat, feeble pulse, and vomiting.

Inflammation of the Bowels.—Colicky pains in the bowels; diarrhœa, with thin, liquid stools containing undigested food and mucus, sometimes blood-streaked; tenderness; high fever; rapid pulse; patient lies on back, with legs drawn up.

Peritonitis, Acute.—Sudden onset, with chill; sharp, and cutting pains in abdomen, with great tenderness; distention of bowels with gas; high fever; hiccough; nausea, vomiting, and constipation; patient lies on back with knees drawn up; pulse small, rapid, "wiry."

Dysentery.—Constant desire to evacuate the bowels, with much straining, and never-get-done feeling; small stools containing mucus and blood; pain; tenderness; prostration.

Cholera Morbus.—Cramps in the stomach and abdomen; vomiting and purging of bilious matter; frequent and copious evacuations; thirst; moderate fever; headache; great prostration; coldness of extremities.

Cholera Infantum.—Vomiting and purging; thin, watery, musty smelling stools; intense thirst; great restlessness; hollow eyes; pinched, pale face; rapid, feeble pulse; rapid emaciation; great exhaustion.

Chills.

Influenza. *La Grippe.*—Abrupt onset; great prostration; chilliness; stiffness, bruised pain in muscles of neck, back and legs; severe pain in head; sneezing, hoarseness and paroxysmal hard cough; running from nose; breathing difficult; or acute nervous symptoms with sleeplessness, intolerable pain in head, delirium, meningitis or severe gastric disturbance or symptoms as in typhoid fever.

Bronchitis, Acute.—Chilliness; debility; soreness and constriction behind breast bone; slight fever; irritative, dry, painful cough becoming loose, with partly mucous, partly purulent expectoration; difficult breathing.

Mumps.—Chilliness; debility; moderate fever; pain in angle of the jaw; doughy swelling of parotid gland; often swelling of other glands under one or both sides of jaw, and in throat; increase of saliva; may be sympathetic swelling of breasts or testicles.

Bright's Disease, Acute.—Chill followed by fever; nausea; face puffy; extremities swollen and dropsical; dull pain over kidneys, extending downward; frequent urination; quantity of urine diminished; urine smoky, reddish, turbid and contains albumen.

Bright's Disease, Chronic.—Slower development of symptoms as in acute form; general debility; headache; indigestion; lassitude; nausea; drowsiness; much swelling and dropsy.

Cough.

Bronchitis, Chronic. *Winter Cough.*—Persistent cough, with more or less partly mucous, partly purulent expectoration; soreness behind breast bone; shortness of breath; oppression; rales in chest.

Croup, False Membranous.—Peculiar ringing cough, becoming muffled; hoarseness and difficult breathing continue after a spasm passes; false membrane is coughed up; great restlessness and agitation; clutching at the throat.

Whooping Cough.—In the beginning, slight fever, sneezing, running from the nose, dry cough; in one or two weeks cough more violent and in hard paroxysms, with eyes congested, face bluish, veins disturbed, often vomiting, may be nosebleed, long drawn, shrill whoop at end of paroxysm.

Asthma.—Sudden attacks generally at night; great oppression in chest; distressed breathing, cannot "catch his breath;" profuse perspiration; face pale and anxious; cough and expectoration of thick, tenacious mucus; loud wheezing in chest.

Constipation.

Prolapsus Ani.—Descent or protrusion of mucous membrane of lower bowel through the anus; irritation; constipation; straining at stool.

Piles.—Veins of rectum distended in little lumps; may protrude, bleed, itch, be sore, cause or aggravate constipation.

Depression.

Hydrophobia.—Anxiety; depression; restlessness; pain in wound; slight fever; increasing difficulty in swallowing; spasm of muscles of neck, especially at sight of water; salivation; convulsions; delirium; exhaustion; suffocation; heart failure.

Opium Poisoning, Chronic.—Loss of flesh and strength; trembling; debility; sallow complexion; loss of appetite; disturbed sleep; mental depression; irritability; tendency to lie and deceive; irresistible craving for the drug.

Eyelids.

Stye.—Small, painful boil on eyelid, with heat, redness, swelling, and rapid suppuration.

Tracoma.—Inflammation and thickening of the lining membrane of the eyelids, with formation of granulations on inner side of lids.

Ear.

Inflammation of Middle Ear. Otitis Media.—Inflammation; pain; swelling of the drum and lining membrane of middle ear; watery discharge; with suppurating form, acute pain; ringing in ear; deafness; fever; formation of pus; bulging of drum which may rupture.

Fever.

Chicken Pox.—Fever; chilliness; sparse, superficial eruption of crop of pimples, most abundant on the trunk, drying up in two or three days, with depressed, blackish crust in centre.

Fever and Ague.—Debility; nausea; vertigo; shivering, increasing to severe chill, with chattering of teeth; "goose skin"; hurried shallow breathing; small, rapid pulse. Chill, followed by fever, with face flushed; eyes red; pulse full and rapid; pain in back and limbs; intense thirst; urine scanty. Hot stage followed by free perspiration; decline of fever; increase of urine.

Scarlet Fever.—Vomiting or convulsions; may be a chill; high fever; rapid pulse; heavily coated, then bright red, swollen tongue; throat red, sore; swallowing painful; glands enlarged; great thirst;

scanty urine; fine, diffuse, red rash first on neck and chest; lasting five to seven days, and disappearing momentarily on pressure; eruption leaves branny scales; great restlessness, sleeplessness, headache, often convulsions.

Typhoid Fever.—Gradual onset with headache, debility, vague pains, nosebleed, may be slight diarrhoea, loss of appetite, then gradual rise of temperature, lower mornings, higher evenings; abdomen swollen and tender; with rose-colored spots on abdomen seventh to ninth day; spots disappear on pressure; gurgling in abdomen; pea soup diarrhoea; tongue becomes dry, brown; teeth and lips covered with sticky deposit; delirium or stupor; bleeding from bowels; picking at bed clothes.

Typhus Fever.—Sudden pain in head, back and legs; extreme prostration; fever reaching 104 to 105° in from two to three days, and remaining high about two weeks; rapid, weak pulse; musty odor; face livid and dull; pupils of eyes contracted; coarse, mulberry rash fourth or fifth day on trunk and extremities; urine scanty; marked nervous symptoms; bowels constipated.

Yellow Fever.—Chill, pain in head, back and limbs; rapidly rising fever; vomiting; thirst; constipation; then remission of symptoms for six hours, followed by their acute return; jaundice of skin; black vomit; bleeding from mouth, bladder, etc.; scanty or suppressed urine; great prostration; collapse and death or slow convalescence.

Smallpox.—Chill or series of chills, followed by vomiting and intense pain in small of back; rapidly increasing fever, falling the third or fourth day; rising again seventh or eighth day; pulse full, rapid; skin dry; breathing hurried; red spots first on forehead, face and wrists having hard, shot-like feel; skin between is swollen; soft, yellow, offensive crusts; spots may run together or black and blue spots form.

Rheumatic Fever.—Sudden reddening, swelling and tenderness of one of the large joints, with intense pain; sudden shifting of symptoms to another joint; moderately high fever; rapid, bounding pulse; scanty urine; no appetite; constipation; heavily coated tongue.

Cholera, Asiatic.—Vomiting alternating with painless diarrhoea; frequent, sudden rice-water movements from bowels; excruciating cramps in calves of legs, thighs, arms, and abdomen; face pinched, blue, sunken; cold, clammy sweat; pulse thready, weak; breath cool; voice husky; collapse and stupor.

Inflammation of Spinal Cord, Acute.—Moderate fever; loss of appetite; coated tongue; constipation; followed by radiating pains from back to limbs, with numbness, tingling or burning; pain about waist; loss of motion of limbs and increasing paralysis.

Spotted Fever. *Epidemic Cerebro-spinal Meningitis*.—Sudden onset; chill followed by fever; nausea; great thirst; vomiting; severe, continuous headaches; painful stiffness and retraction of muscles of the neck; dusky mottling of the skin.

Measles.—Sneezing; hoarseness; cough; running from eyes and nose; eyes red and sensitive to light; moderate fever; eruption of small pale or dark red velvety spots on face, then on trunk and extremities, with itching and burning; eruption lasts four days to a week.

Heart.

Weak Heart.—Palpitation, with feeling of oppression about chest; fluttering, irregular pulse; headache; dizziness; bloodlessness; debility; indigestion.

Enlargement of the Heart. *Hypertrophy*.—When excessive there may be weight and discomfort in the chest; bulging of chest wall; a heaving impulse of heart against chest; shortness of breath; headache; vertigo; ringing in the ears; paroxysmal cough; palpitation; indigestion; sleeplessness.

Neuralgia of the Heart. *Angina Pectoris*.—Sudden attacks of excruciating pain in the heart, with horrible sense of suffocation; face pale and cold; pulse variable, often weak and irregular; pain in left shoulder; attack passes off with belching of gas.

Inflammation of the Heart.—Pain in region of the heart, sense of oppression; anxiety; difficult breathing; fever; slight cough; headache; vertigo; may be nausea; irregular action of heart; palpitation.

Headache.

Chlorosis. *Green Sickness*.—Impoverished blood at puberty; greenish pallor of skin; palpitation; indigestion; nosebleed; irritability; appetite for chalk, slate pencils, etc.; debility.

Brain Fever.—Intense headache; vertigo; intolerance to light and sound; restlessness; heat in head; eyes bloodshot; fever; later, drowsiness and inclination to vomit; convulsions in children; rapid, feeble pulse.

Insensibility.

Epilepsy.—Peculiar, premonitory sensation beginning in finger or toe, followed by sharp cry, and sudden fall to the floor, with partial or complete loss of consciousness, frothing at mouth; biting of the tongue; clenching of fingers; face becomes bluish; pupils dilated; stupor for a varying period follows, or immediate consciousness with soreness, weakness and mental confusion.

Hysteria.—Convulsive seizures simulating epilepsy, but patient generally falls in a comfortable place; is only apparently unconscious;

screams, cries, or laughs; urine often retained; sensation of ball in the throat; headache as of nail in the head; may be partial paralysis, or legs and arms thrown wildly about.

Apoplexy.—Patient suddenly falls unconscious; face flushed; breathing labored; pulse full and slow; paralysis on one side; tongue protruded; may be convulsions, and involuntary passage of urine and feces.

Catalepsy. *Trance.*—Patient apparently insensible; lies quiet; limbs remain in any position they are placed; muscles stiff and unyielding.

Sunstroke.—Weakness, dizziness and faintness after exposure to heat, or partial or complete unconsciousness; pallor of face; cold sweat; shallow, hurried breathing; or dry, burning skin; face and eyes congested; pulse full and rapid; pupils contracted; stupor; a dangerous form.

Paralysis.—Attack preceded by numbness, coldness, paleness, and slight convulsive jerking or twitching, followed by loss of motion partial or complete, and of upper or lower half of body, or one or both sides; may be loss of speech and other faculties.

Lungs.

Bleeding from the Lungs.—May be preceded by cough, difficult breathing, warmth or tenderness in chest, salty taste in mouth; blood may gush up or be coughed up, will be bright red, fluid, and frothy, and taste sweetish or salty.

Pneumonia. *Lung Fever.*—Sudden hard chill and sharp pain in the side, with sharp rise of temperature, generally falling suddenly to normal the fifth, seventh or ninth day; shallow, very rapid, difficult breathing; short, dry, hard cough, later with blood-streaked, rusty expectoration, becoming free and like prune juice; pain in chest; no appetite; tongue coated; thirst, scanty urine; congestion and consolidation of lungs; may be typhoid symptoms.

Consumption. *Pulmonary Tuberculosis.*—Fatigue and short breath on slight exertion; loss of appetite; imperfect digestion; paleness, with hectic flush over cheek bones; irregular fever; hacking cough, at first dry, later with increasing expectoration; night sweats; loss of weight; bleeding from lungs; may be diarrhœa; tubercle bacillus in expectoration; contraction of chest; swelling of feet.

Nose.

Hay Fever.—Great susceptibility to pollen of rag weed, hay, roses, etc.; redness of eyes, swelling of eyelids; sneezing; running from eyes and nose; obstruction of nose; headache; cough; may be asthma.

Catarrh, Chronic Nasal.—Mucous or partly mucous, partly purulent discharge from nose, obstruction of nostrils; mouth breathing; nasal voice; headache in forehead; dropping of secretions into throat; frequent hawking; may be deafness and loss of taste or smell.

Pain.

Inflammation of the Liver.—Drawing sensation on the right side in region of the liver; slight chill; fever; headache; indigestion; loss of appetite; may be nausea and vomiting; slight jaundice; scant urine; sometimes hiccough; weakness; loss of flesh.

Lockjaw. Tetanus.—Painful, increasing stiffness of the head, neck, and pain extending to back, abdomen and extremities; corners of mouth drawn upward; jaws tightly closed; body convulsively arched or rigidly straight; slightest touch causes spasm with great pain.

Pleurisy.—Sharp, stabbing pain in the side, worse on deep breathing and motion; breathing feeble, shallow and rapid; slight, irritative cough; scanty, frothy expectoration; may be effusion of fluid into covering of lungs, with chills, fever, sweats and emaciation.

Gout.—Restlessness; wakefulness; irritability; dyspepsia; scanty, high-colored urine; agonizing pain and tenderness in ball of great toe; toe reddish purple and glazed; veins enlarged; in chronic gout joints enlarged, deformed, chalky, stiff, may ulcerate.

Gall Stone Colic.—Passage of gall stones causes sudden, agonizing, cutting, tearing or shooting pain on the right side of abdomen, spreading to right side of chest and shoulder; muscles of abdomen cramped and tender; nausea; vomiting; profuse sweat; frequent urination; pale, distorted, anxious face; feeble pulses.

Painter's Colic.—Violent, painful contractions of the abdominal muscles; hollowing in of the abdomen; obstinate constipation; gripping, cutting pains; may be blue line around the gums.

White Swelling. Tubercular Arthritis.—Dull pain in joints, worse by motion or jarring; tenderness on pressure; more or less swelling and exudation of fluid; wasting of muscles above and below; skin white and shiny.

Sciatica.—Sharp, shooting pain running down the back of thigh; worse from motion; may be tingling and numbness, and nerves sensitive to touch; worse at night and in stormy weather.

Stone in the Kidneys.—Constant dull pain in the loin; on passage of stone, excruciating paroxysm of pain radiating into groin and bladder; numbness of thigh; nausea; vomiting; sweat; rapid pulse; sufferer may faint.

Inflammation of the Testicles. *Orchitis*.—Drawing, stretching pains from abdomen through spermatic cords and testicles; testicles swollen, sensitive, with soreness and tearing pains; drawing up of testicles, burning and difficulty in urinating.

Writer's Cramp.—Fatigue, weight or actual pain in muscles of hand; spasm of muscles when fingers grasp a pen; hand may tremble or neuralgic pain occur.

Hip Joint Disease.—Slight lameness; stiffness of muscles about the joint; progressive wasting of muscles of thigh; limping, with shortening of leg; more or less fluid in joint, and restriction of motion; formation of abscess, with pain and tenderness; deformity of hip.

Poisoning.

Arsenic Poisoning.—Burning in stomach and bowels; cramps in abdomen and legs; vomiting followed by diarrhoea; rice-water stools which are bloody.

Lead Poisoning.—Obstinate constipation; abdominal colic; wrist drop; blue line about the gums; cramps in the legs; pains in the joints; trembling of extremities; intense headache; may be convulsions, delirium and lethargy.

Skin.

Eczema. *Salt Rheum*.—Inflammation of skin, with watery pimples or pustules forming scales and crusts; itching; burning; watery or yellow sticky discharge, or oozing; raw surface beneath crusts; or dry, scaly patches, without itching.

Itch. *Scabies*.—Small pimples first appearing between fingers, in creases of wrists, groin, armpit, under the breasts, on inner side of thighs, with intense itching.

Ringworm of the Scalp.—Small, separate, round or irregularly shaped, reddened scaly patches, turning to little vesicles filled with matter, which dry up and scale off; hair dead and brittle; patches spread rapidly.

Shingles.—*Herpes Zoster*.—Pin head to pea-sized watery pimples along a nerve, preceded, accompanied or followed by neuralgic pains in affected part; one side of body only; fluid dries up, and yellow-brown crusts form and drop off.

Nettle Rash. *Urticaria*.—Skin shows pale red elevations, itching intensely; finger drawn over surface causes white line which becomes elevated and red; eruption on covered parts of body especially.

Boil.—Small, limited, painful tumor beginning as a sore, itching pimple, developing a core of dead tissue, and suppurating.

Carbuncle.—Dark red, painful, circumscribed, flattened swelling, surrounded by dusky-red skin, appearing on neck, back or buttocks, suppurating in a week or ten days, and discharging through several openings.

Cancer of the Skin. *Epithelioma.*—In the beginning a few greasy scales or papery crust covering three or four shallow irregular ulcers with hard margin; or may be deep-seated, shiny, hard, red lump, changing to ulcer with blood-stained yellow fluid, or offensive sticky discharge; sharp, shooting pains.

Blackheads. *Acne.*—Small pimples on face, chest, shoulders, back, neck; moist or dry; reddish or black; with or without indigestion, debility, menstrual disorders; may contain matter or cheesy substance.

Warts.—Pin head to bean-sized, limited elevation of the skin; some soft, red, dry or moist; bleed easily; some soft and pearly; others hard, black, flat or rounded.

Gangrene. *Mortification.*—In dry form, skin pale, dry, shriveled, semi-translucent, with bluish-mottled specks becoming dark, opaque, mummified; in moist form, congestion of part; skin dark, livid, moist; tissues soften and break down; foul odor.

Ulcers.—Sore on leg or elsewhere, red, inflamed, irritable, with painful, ragged edge; or varicose ulcer with much distention of nearby veins; or syphilitic ulcer with punched-out looking sore, and offensive discharge.

Milk Crust.—Small pimples form on face or scalp of infants and children, with redness and itching; pimples rupture and exude a sticky fluid forming yellow crust, with raw surface underneath.

Scurvy.—Great debility; bloodlessness; spongy, bleeding gums, with foul breath; teeth loosened; pain in legs; skin dry and rough; flesh brawny and hard; complexion shallow; bleeding from mouth, bladder, etc.; short breath; feeble pulse.

Erysipelas.—Slight fever, chilliness, tingling of affected part, which becomes glossy, bright red or brawny, swollen, hard, sharply defined; fever increases; pulse full, rapid; appetite lost; bowels constipated; tongue coated; small pimples form; inflammation spreads or begins to subside in four or five days.

Swelling.

Scrofula.—Swelling and suppuration of glands of neck, groin and under the arms; sometimes slight fever, debility, emaciation; free perspiration, especially about the head.

Goitre.—Usually non-painful, non-tender swelling of varying size of thyroid gland in neck; when large, causing difficult breathing, headache, flushed face; may be shooting pains.

Dropsy.—Swelling of feet, hands, legs, abdomen or chest in lung, liver, kidney or heart disease; swelling and paleness of skin; surface hard and pitting on pressure of finger.

Goitre, Exophthalmic.—Debility and bloodlessness; enlargement of thyroid gland; protrusion and staring appearance of eyes; palpitation; pulse beats 100° to 140° a minute; blowing sound over gland.

Stomach.

Dyspepsia, Nervous.—Tongue often clean, appetite very variable, may crave acids, slate pencils, etc.; headache; vertigo; irritability; depression; sleeplessness or bad dreams; lassitude; palpitation; lump in the chest.

Dyspepsia, Catarrhal.—Loss of appetite; sense of fullness and discomfort; eructations; nausea and sometimes vomiting; tongue heavily coated; mucus in vomitus and stools; may be diarrhoea; hiccough; heartburn.

Bleeding from the Stomach.—Usually occurs with vomiting and is provoked by taking food; blood is dark, clotted, and generally mixed with contents of stomach.

Neuralgia of the Stomach.—Intense, griping, agonizing pain in stomach usually extending to the back, with belching of gas, faintness, and intermittent pulse; symptoms partially relieved by pressure over stomach.

Cancer of the Stomach.—Indigestion; great acidity; flatulence; loss of appetite; foul breath; great debility; emaciation; vomiting; coffee-ground vomit from retained blood; pain, more or less continuous.

Colic in Infants.—Sudden paroxysms of spasmodic crying often waking child from sleep; jerking of the feet; clenching of the hands; sudden drawing up, then straightening of the legs; flatulence; distention or retraction of the abdomen; contortions of whole body.

Sores.

Syphilis. First Stage.—Within a month of exposure, small, red sore appears on genitals, which enlarges and breaks in centre, leaving ulcer; nearby glands enlarge and become hard; may be no impairment of general health.

Syphilis. Second Stage.—Within six or eight weeks, sore throat; moderate fever; languor; headache; bone pains; indigestion; ulcers

on throat or tonsils; dull copper-hued eruption on abdomen, chest, arms, shoulders, genitals.

Syphilis. *Third Stage.*—Within one or many years, pustules on body which form deep ulcers, with dry crusts and scales; loathsome sores leaving bad scars; ulceration of throat, palate, nose; hard lumps in muscles and under skin.

Abscess.—Localized inflammation, with heat, swelling, pain, formation of pus, tendency to point and discharge matter.

Throat.

Tonsilitis.—Tonsils swollen; difficulty in swallowing and much pain; often cheesy spots or patches on tonsils and throat; dribbling of saliva; fever; headache.

Enlarged Tonsils.—Tonsils too large; may contain minute cavities containing foul, cheesy matter; mouth breathing, difficult swallowing; snoring during sleep; mental dullness; night terrors; deafness; bad breath; thick voice.

Quinsy.—Tonsilitis symptoms, together with inflammation of deeper tissues; chills; high fever; swelling of glands of neck; supuration, and formation of tonsilar abscess, with tendency to point and discharge.

Croup, Spasmodic.—Hoarseness and slight cough during day; sudden awakening at night by severe paroxysm of suffocative, hard, barking cough; skin hot; pulse tense and rapid; perspiration.

Pharyngitis.—Soreness of back of mouth and throat; pain on swallowing or difficult swallowing; coating of glairy mucus on roof of mouth, tonsils and throat; some fever; swelling of affected parts.

Diphtheria.—Chills, moderate fever, sore throat, indisposition, followed by stiffness and swelling of glands of neck; grayish white membrane in throat, removal of which causes bleeding; weak pulse, scanty urine; detection of Klebs-Löffler bacillus.

Thrush.—Swollen, red, spongy gums; flaky, white deposits of lining membrane of mouth, leaving bleeding spots when removed; fever; pain in mouth; mouth waters; bad breath.

Urine.

Incontinence of Urine. *Enuresis.*—Profuse involuntary flow of pale, watery urine; constant dribbling of urine while sitting or walking; dribbling of scanty, high colored urine; wetting the bed at night.

Retention of Urine. *Strangury*.—Urine passed drop by drop, with much urging and straining; pain and heat along the urethra; difficult, scanty urination.

Stone in the Bladder.—Irritation and inflammation of bladder; frequent burning discharge of small amounts of urine, with urging; acute pain on passage of stone, with bloody urine; sudden stoppage of stream of urine.

Inflammation of the Bladder. *Cystitis*.—May begin with chilliness and fever, then constant dull ache, or sharp agonizing pain in bladder; frequent urging to urinate, with burning pain on urinating; pus in the urine.

Diabetes Mellitus.—Gradual failure of health; frequent and excessive urination of pale urine, loaded with sugar; great thirst and emaciation; large appetite; constipation or exhausting diarrhœa; skin, mouth and throat dry; itching of skin; teeth decay; failure of sexual powers.

Jaundice.—Yellowishness of the skin, white of eyes, inside of mouth and of urine and feces; stools light colored; urine dark; may be itching of the skin; mental depression; delirium, convulsions, and stupor in bad cases.

Inflammation of Urethra. *Gonorrhea*.—Burning heat, tenderness and puffiness at entrance of urethra; catarrhal discharge, soon turning to thick, purulent matter; frequent, painful erections; urine passed in spurts, drops or twisted stream.

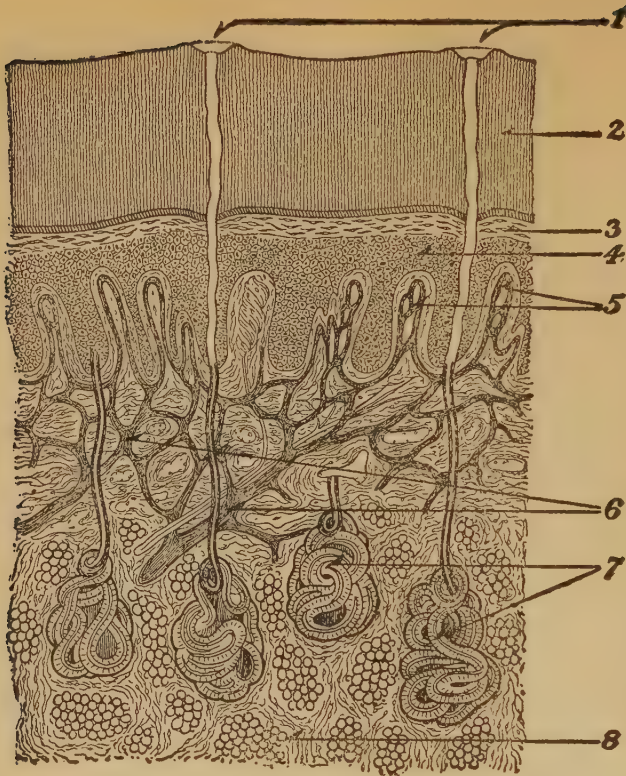
Dropsy of the Abdomen.—Sensation of weight in the abdomen; distention; difficult breathing; scanty urine; swelling of the feet; constipation; fluctuation of fluid on pressure.

Worms.

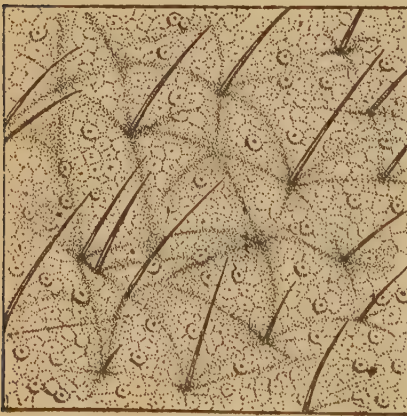
Worms.—Loss of appetite or ravenous hunger; disturbed sleep; great restlessness; picking at the nose; bad breath; lassitude; dark circles round eyes, indigestion; straining at stool; itching of anus; grinding of teeth in sleep; may be colicky pains.

Tape Worm.—May be no symptoms, or may be indigestion; mucous stools; colicky pains; voracious appetite; debility; night terrors; intense itching of nose and genitals; twitching of muscles; convulsions.

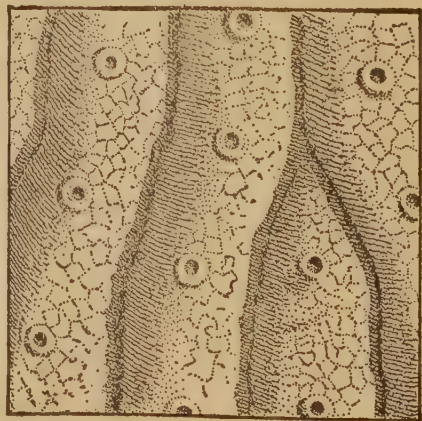
The Skin Magnified.



1. Pores of Skin. 2. Outer layer of Skin or Cuticle. 3. Dermis or upper layer of true Skin. 4. Under layer of true Skin. 5. Nerve Prolongations. 6. Blood Vessels. 7. Sweat glands surrounded by cells of fat. 8. Glands or cells of fat.



Skin of the back of the hand showing pores, glands and hair (magnified).



Skin of the palm of the hand magnified 1000 times, showing pores through which sweat passes.

SKIN DISEASES.

THE skin is the soft and pliant membrane which covers the entire surface of the body. The interior, like the exterior is likewise covered by a skin, which, from its always being moist, is called a mucous membrane. At the various openings of the body, the outer and the inner skins are united, — forming one continuous skin, — like the same piece of silk turned over the border, and covering both the outside and inside of a bonnet.

From this continuity or oneness of the skin and mucous membrane springs an important medical law, namely, that a disease of the skin may spread to the mucous membrane, and a disease of the mucous membrane may spread to the skin. We see this illustrated by the breaking out around the lips which follow colds, and the itching of the nose of children when the mucous membrane of the bowel is irritated by worms.

The Skin is Composed of Two Layers.— These are separated from each other by the action of a blister. The thin portion which is raised up by the fluid of a blister is called the *scarf skin*, the *cuticle*, or the *epidermis*; that which remains in connection with the body is the *sensitive skin*, the *cutis*, the *derma*, or the *true skin*. The two skins have very different offices to perform. The scarf-skin is horny and insensible, and serves as a sheath to protect the more sensitive skin under it. Were the scarf-skin taken off, we could not bear to have anything touch us.

The *derma*, or *true skin*, and its glands, etc., are the seat of all the cutaneous diseases. These may be separated into four great divisions, — namely, diseases of the *true skin*, diseases of the *sweat glands and tubes*, diseases of the *oil glands and tubes*, and diseases of the *hairs and hair glands*.

Then the diseases of the true skin are divided into

Inflammation of the true skin;

Enlargement of the papillæ of the true skin;

Disorders of the vessels of the true skin;

Disorders of the sensibility of the true skin;

Disorders of the color-producing function of the true skin.

The inflammation of the true skin is conveniently divided into two groups, — namely,

Such as are marked by inflammation of the derma and mucous membranes, *with constitutional symptoms of a specific kind*, and

Such as are distinguished by inflammation of the derma, *without constitutional symptoms of a specific kind*.

Congestive Inflammation of the True Skin.

The First of these Groups,—those characterized by inflammation of the cutis, *with constitutional symptoms of a specific kind*,—embraces *measles, scarlet fever, varioloid, and cow-pox*.

Measles. — *Rubeola*.

MEASLES is an acute inflammation of the entire skin, both external and internal, associated with an infectious and contagious fever.

Symptoms.—The disease sets in with chills, succeeded by burning heat, listlessness, languor, drowsiness; pains in the head, back, and limbs; frequent pulse; soreness of the throat; thirst, nausea, vomiting, frequent dry cough and high-colored urine. These symptoms increase in violence for four days. On the third day the eyes become inflamed, cannot bear the light, and pour forth a profusion of tears. This last symptom is called *coryza*. The nose likewise discharges a large quantity of watery secretion, and sneezing is frequent. The larynx, windpipe, and bronchial tubes become inflamed, and hoarseness, soreness of the breast, etc., are the result.

The redness of the skin and breaking out appear about the fourth day, and produce heat and itching. This breaking out is characterized by a patchy redness, which, on close inspection, is found to consist of numberless minute red points and pimples, collected into patches in the shape of a half or quarter moon. They appear first on the forehead and front of the neck, then upon the cheeks and around the nose and mouth. On the fifth day they reach their height in this region, and then appear upon the body and arms, and on the sixth day, upon the legs. The color of the skin, when the inflammation is at its height, is *of a bright raspberry red*. The decline of the rash takes place in the same order in which it comes out. The redness fades on the sixth day upon the face; on the seventh, upon the body and limbs; on the eighth, upon the back of the hands. The *coryza*, the hoarseness, and the cough, decline about the seventh day, while a diarrhoea comes on about the eighth or tenth, — showing that the inflammation of the mucous membrane is subsiding. When the inflammation disappears, the whole scarf-skin peels off in the form of a scaly scurf. The artist has given a good picture of the disease in the beautifully colored lithograph, PLATE I, Fig. 1.

Treatment.—When the disease is mild and regular in its course, scarcely anything will be required, except mild diet, slightly acid drinks, with flax-seed tea, slippery elm, or some equivalent, to quiet the cough. Sponging with tepid water, if done with frequency, moderates the fever, and adds to the comfort of the patient. If the fever



MELBA



SCARLET FEVER

runs high, take half an ounce of rochelle salt, and use recipe 125.

Those who have been exposed to the contagion, and are liable to have the disease, should avoid all unnecessary exposure to wet or cold, — keeping the feet warm and dry, and the whole body well clad. With these precautions, and a mild, unstimulating diet, much of the force of the disease may be broken.

During the first stages of the disease if the onset has not been stormy nothing further will be necessary than the precautions already advised. Should, however, the rash be delayed or appear in patches over the body, the patient should be given a full bath of either hot water or hot water with the addition of mustard in the proportion of two teaspoonfuls to the gallon. The employment of hot drinks should be limited to saffron tea or hot lemonade, as we use care not to add to the existing high fever which usually is present when the eruption is slow in appearing.

Besides the milder forms of the disease, cases occur, chiefly in broken-down constitutions, in which the rash delays its coming out till the seventh day, and is then mingled with dark and livid spots, which remain, often, for ten or twelve days. The fever is of a low, typhoid kind, and the patient is extremely weak and languid.

In this condition of things, the patient must be supported by tonics (77 and 59), and whisky, and expectoration promoted by some appropriate remedy, if required.

If at any stage of the disease there should be fixed pain in any part of the chest, which is made worse by coughing, or by taking a full breath, we may conclude there is some inflammation of the chest.

The seriousness of this complication will be understood from the fact that the bronchitis has now extended and small patches of inflammation known as broncho-pneumonia have appeared. Medicines to enable the patient to raise the phlegm easier, such as five grains of chloride of ammonia in two tablespoonfuls of sweetened water or simple syrup may be given every three hours, and 1-80 of a grain of sulphate of strychnia to support the heart, in addition to the other treatment given under the heading "broncho-pneumonia."

Scarlet Fever. — *Scarlatina*.

THIS is likewise an acute inflammation of the entire covering of the body, both external and internal, connected with fever which is infectious and contagious.

Symptoms.— The fever comes on somewhere between the second and tenth day after exposure. On the second day of the fever, the eruption comes out in the form of very small points and pimples, which appear either in patches, or constitute a general redness, *of a bright scarlet color*. In PLATE I, Fig. 2, the artist has given a fine picture of the disease.

The disease begins with languor, pains in the head, back, and limbs, with drowsiness, nausea, and chills; and these are followed by heat, thirst, etc. When the redness appears, the pulse is quick, and the patient is anxious, restless, and sometimes delirious. The eyes are red, the face swollen, the tongue covered in the middle with white mucus, and is studded with elevated points of extreme redness. The tonsils are swelled, and the throat red. The greatest degree of redness is reached on the evening of the third or fourth day from its beginning, when a gentle moisture appears, the disease begins to decline, with itching, and the scarf-skin falls off in branny scales.

A swelling or puffiness of the flesh, which spreads out the fingers in a singular manner, seems to be peculiar to scarlet fever.

In the first stage of the complaint, the tongue, as stated above, is covered with a fur; but as it advances, the tongue often becomes suddenly clean, and presents a glossy, fiery-red surface, which is sometimes, with the whole lining of the mouth, raw and tender.

It is peculiar in this complaint, that the inflammation of the throat always runs into a state of ulceration. As far as can be seen, on pressing down the tongue, the throat is swollen and of a deep, florid red; and on the tonsils may be seen white or gray ulcers. This makes swallowing very difficult, and aggravates the sufferings of the patient. The great amount of mucus in these parts causes also a continual rattling in the throat.

In quite a large number of cases of this disease the usual ulceration of the throat is replaced by an attack of true diphtheria, which, if at all severe, will require the giving of antitoxin of diphtheria in addition to the treatment recommended for scarlet fever.

The eustachian tube, which extends up to the ear, is apt to get involved in the inflammation, and cause swelling and pain in that region. The glands under the ear and jaw sometimes inflame, and after a time they occasionally break. Abscesses formed in the ear frequently produce some deafness which is not easily cured.



FIG. 72.

In the cell-dropsy, which sometimes appears after scarlet fever, the crystals of urate of ammonia may often be found in the urine with the microscope (Fig. 72).

This disease resembles measles, but may be distinguished from it by the absence of cough; by the eruption being *finer*, and of a more *scarlet color* (see plate); by the rash coming out on the *second* day instead of the *fourth*; and by the ulceration in the throat.

Treatment. — In ordinary cases, the treatment should be very simple. The apartment should be kept cool, and the bed-covering light. *The whole body should be sponged with cool water as often as it is hot and dry*, and the patient be permitted to take cooling drinks. Besides this, in many cases, very little is needed, except to give a few drops of the tincture of belladonna, night and morning.

The cold stage having passed, and the fever set in, warm water may be used without the mustard, etc. If the head be affected, put mustard drafts upon the feet. Should the bowels be costive, they may be gently opened by some very mild physic.

No solid food should be allowed; but after the first shock of the disease is passed, drinks, in reasonable quantities, will be advisable,—such as cold water, lemonade, barberry and tamarind water, rice water, balm or flax-seed tea, and some thin water-gruel.

To promote the action of the skin, the spirits of nitre, with other articles (125), adapting the dose to a child, will be found useful.

Muriatic acid, forty-five drops in a tumbler filled with water, and sweetened, and given to a child in teaspoonful doses, is a good remedy.

In very violent attacks, the system sometimes inclines to sink immediately; typhoid symptoms show themselves; there is great prostration; the eruption strikes in; the skin changes to a purple or mahogany color; the tongue is of a deep red, or has a dark-brown fur upon it, and the ulcers in the throat become putrid. This is called scarlatina maligna; but it is only a severer form of the same disease.

The treatment of this form must be different from that recommended above. It must be *tonic*. Quinia (65) must be freely given. Wine whey, mixed with toast-water, will be useful. Tincture of cayenne, in sweetened water, may be given often in small doses. Ammonia (135) may likewise be given as a stimulus. Gargles (245) (244) (243) are also required.

A dropsical affection is one of the most frequent results of scarlet fever. It is believed that this seldom occurs, if the warm bath is daily used, as soon as the skin begins to peel off. After the dropsy has set in, give the warm bath twice a week, and encourage perspiration by the compound tincture of Virginia snake-root, and similar articles.

In young children, also in severe cases of fever or where the kidneys are not working properly as shown by swelling of the face, abdomen and extremities, milk should be the only article of diet allowed until these symptoms have quieted down. Should the stomach reject the milk, you may add lime water, a teaspoonful to a tumbler of milk. From one pint to two quarts of milk according to age will maintain the nourishment of anyone over days and weeks at a time and gradually the different broths, as chicken or lamb and beef tea, may be added, and later bread and butter, boiled custard, rice and tapioca puddings.

Anointing the skin with vaseline at night and washing off in the morning with suds removes the poisonous scales, and lessens the danger of contagion, as well as improves the activity of the skin. Nasal and aural catarrhal diseases are commonly observed to follow scarlet fever and need attention of a physician. Rheumatism likewise is a frequent sequela, while nephritis or inflammation of the kidneys is often a sad reminder of the disease. These two complications are to be treated as directed elsewhere.

Smallpox-Vaccination.

WHEN certain substances are injected into the body after a patient has been taken ill with a certain disease the object of such injection is to counteract the inroads of the disease and, of course, cure the patient. This is known as a bacterial vaccine and in some instances as a serum. As an instance of the last named and one which is known to all is the use of the anti-diphtheritic serum which is explained under the title diphtheria as a serum obtained from the blood of a horse which has been inoculated with the poison or toxine of diphtheria and has grown in his own blood an anti-toxine which is used in the human body for the cure of diphtheria. Now another vaccine of much older knowledge and which acts in a different way, namely the vaccine of cowpox, is used to prevent a person from acquiring the disease rather than the curing of the disease after it has been acquired. This substance acts by introducing an organism into the blood which has a connection more or less remote with the disease from which the patient is to be protected, and within the person's body this organism is elaborated so that protective substances form to counteract the disease when the person is exposed to it. The vaccination against smallpox is done by inoculating a person with vaccine from a calf which has had the so-called cowpox, a mitigated variety of smallpox. This was discovered one hundred or more years ago by Jenner who found that the dairymaids in Switzerland broke out in a more or less general eruption from contact with cows that had a similar eruption; especially if the dairymaids had abrasions on their hands when milking they were liable to become infected. It also was noted that when epidemics of smallpox appeared these dairymaids and they alone did not contract the last disease. From that on, beginning with inoculation from human to human and later from animals to human, the system of immunization against smallpox has been progressive.

There can practically be no danger, one may be abundantly assured, if under proper inspection only healthy cows are inoculated in the first place, and simple, well-understood methods followed of cleaning the arm and using sterile instruments to scarify the patient when the vaccination is performed. The operation is so simple in its performance and the protection is so inestimably great that we cannot speak too strongly in the favor it confers on the community.

Instance after instance can be cited to prove the efficacy of the precaution, where one poor result, or possibly fatal result, can be instanced by the opponents of vaccination. Beginning from three to ten days after the arm has been inoculated with the vaccine a small spot shows at the spot which has *not* been scratched deep enough to cause much blood to run, but only to have a little thin serum start from the scratched skin. The best serum used comes put up in small glass capillary tubes which by being sealed at their ends cannot

be contaminated by other influences, and will hold good for the time stamped on them before they lose their power to protect. If a reddened arm has not appeared by the end of ten days it is assured that the patient is either protected by a former vaccination or an attack of smallpox or varioloid which, of course, immunizes him for the rest of his life or else the strength of the serum was vitiated so that a new inoculation should be done. If the person is going to react to the vaccination, or take, as it is known to us, this small reddened spot increases and has a hard and at times pustular appearance, increasing in size and by the end of a week has reached its greatest development.

It is usually recommended to vaccinate once in five to seven years as the majority of people "run out" in that period. Should an epidemic occur at any time after three or four years from the first vaccination a second vaccination is recommended by the best authorities. At most no harm can be done by the precaution, for should the arm not become sore a second time it will prove that the first vaccination still protects you; while if the arm does become sore it denotes the fact that you would catch smallpox if exposed to the disease and now the vaccination will immunize you from further sickness. It can be almost a matter of assurance that no one who has been vaccinated and reacted to the virus within a sufficiently recent number of years will contract smallpox even if exposed. Should they have been vaccinated at any time in their lives their chance of taking it is very small, and if they take it the disease will be so mitigated by the previous vaccination that the danger of death is practically null, depending somewhat upon how recently or remotely the vaccination was done; while if they have never been vaccinated their chance of recovering is only about fifty per cent. Again, if exposed to smallpox, vaccination by its shorter period of inoculation will influence the disease even if smallpox appears. By that we mean the vaccination will, if performed at once when a person has been exposed to smallpox, protect him to a greater or less degree from the severity of the main disease. This was lately proved in the practice of the writer where a case that had been thought to be measles proved to be smallpox. The writer when called to the case diagnosed the disease as probably smallpox, and desired to vaccinate the members of the household. The patient with the suspected disease was only moderately sick and was at once vaccinated. The other members of the family with the exception of one were vaccinated at the same time and all escaped. The one exception, above noted, left the house between the first visit of the doctor and his return an hour later with vaccine virus, and her whereabouts did not become known until three weeks later when her death occurred several hundred miles from the first place where she had been. Her foolishness resulted in her death and it was never clearly known what the cause of her antagonism to vaccination was due to except she thought the true case of smallpox was measles, and she did not desire to be vaccinated against measles.

TABLE EXHIBITING THE DIFFERENCE BETWEEN SMALL-POX, VARIOLOID, SCARLET FEVER AND MEASLES.

SMALL-POX.

First. Period between exposure and when disease first shows itself is from five to twenty days — usually shows itself in ten or twelve days.

Second. The fever and temperature is high, but is less after rash appears.

Third. The rash appears on third or fourth day and is seen on the forehead or some part of face.

Fourth. The eruption first consists of pimples, then watery blisters which become white and sink in the center.

Fifth. The tongue is coated and swollen.

Sixth. The eyes do not run, and bronchitis does not appear.

Seventh. Sore throat is often present but not so great an extent as in Scarlet Fever. Delirium and convulsions may occur.

Eighth. Secondary fever appears after several days.

Ninth. There are apt to be pocks and the eyesight be weakened, but by modern treatment it can usually be avoided.

SCARLET FEVER.

First. Period between contagion and when disease first shows itself is usually from three to six days, but may be much longer.

Second. Fever greatly increased and continues without abatement after eruption appears.

Third. Eruption makes its appearance on second day on the chest and neck and spreads over the body during the next twelve hours.

Fourth. The eruption extends over the entire skin.

Fifth. Eruption lasts from six to seven days when it begins to come off in large scales.

Sixth. Tongue is covered with little red points.

Seventh. There is little trouble with bronchitis or running of eyes.

Eighth. Sore throat.

Ninth. The mind is apt to be affected and there may be delirium.

Tenth. Usually no secondary fever.

Eleventh. In Scarlet Fever there is great danger of the patient being left with kidney trouble, or the eyes, ears, or throat may be affected.

VARIOLOID.

First. Period of incubation more irregular than Small-Pox — from five to twenty days — averages twelve days.

Second. Fever high till rash is well developed and then a greater improvement than in Small-Pox.

Third. Eruption appears on third or fourth day.

Fourth. Rash consists of pimples, may go on to pustules and blisters, but usually subside before advancing so far.

Fifth. Tongue coated and swollen.

Sixth. No nose or eye symptoms as a rule.

Seventh. Sore throat mild. Delirium and severity of disease often marked at beginning but quickly subside.

Eighth. Secondary fever less marked than in Small-Pox.

Ninth. Instead of rapidly convalescing, the patient often shows an amount of weakness and anemia all out of proportion to preceding symptoms.

MEASLES.

First. Period between exposure and when disease first shows itself is from seven to fifteen days.

Second. There is a moderate fever. It does not decrease but increases after eruption.

Third. Eruption appears on fourth day on face and spreads over rest of body in about two days.

Fourth. Eruption is crescent-shaped, rest of skin healthy.

Fifth. Eruption lasts about five days, then peels off in scales.

Sixth. Tongue has red edges and is coated.

Seventh. The nose and eyes run and bronchitis is usually apparent.

Eighth. Usually throat is not sore.

Ninth. The mind is not affected.

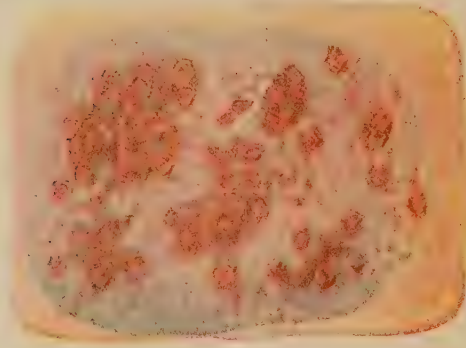
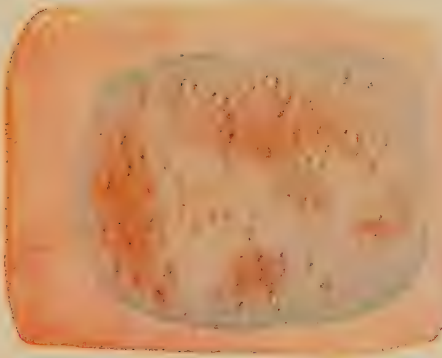
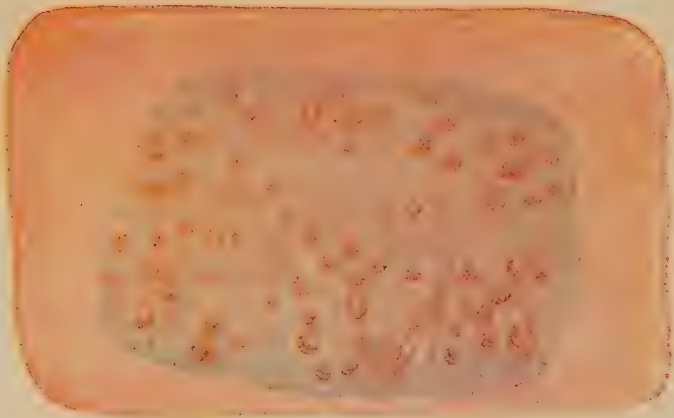
Tenth. The fever subsides after the third day and there is no secondary fever.

Eleventh. The patient's eyes may be inflamed and consumption or bronchitis follow.

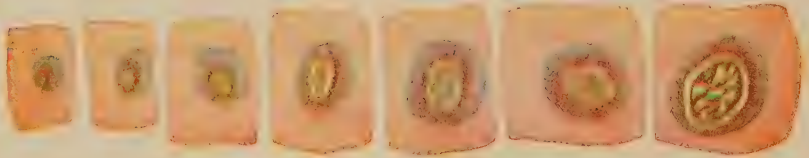
Small-Pox. — Variola.

THIS is another disease characterized by acute inflammation of the entire skin, both external and internal, connected with infectious and contagious fever. The eruption has the form of red points, which soon become pimples, then vesicles, then flattened and scooped-out vesicles, then pustules, and finally hard brown scabs. These last fall off from the eleventh to the twenty-fifth day, and leave behind them small pits and scars. The fever is remittent, and precedes the eruption some three or four days, — ceasing when the eruption is developed, and returning when it has reached its height. The period between exposure and the attack of the disease, called *incubation*, is from five or six to twenty days, — being short in the severe cases, and longer in the milder ones.

Symptoms. — The disease begins with languor and lassitude, with shivering, and pains in the head and loins; with hot skin, and quickened pulse and breathing; with thirst, loss of appetite, and furred tongue; with nausea, vomiting, constipation, restlessness, and uni-

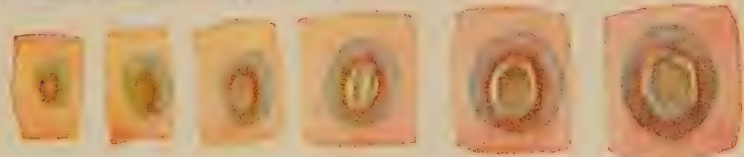


*Progress of
Small Pox.*



1st day. 2nd day. 3rd day. 4th day. 11th day. 14th day. 17th day.

*Progress of
Varioloid.*



1st day. 2nd day. 10th day. 12th day. 13th day. 16th day.

*Progress of
Vaccination.*



4th day. 7th day. 10th day. 11th day.

versal prostration. To these symptoms sometimes succeed difficult breathing, cough, drowsiness, and even insensibility. The tongue, white at first, soon becomes red at the point, and over the whole surface. The fever is highest during the night. The constitutional symptoms are more violent just before the eruption, but immediately subside, and soon disappear, when the breaking out is established. The eruption is at first in the shape of small red points, which are *hard* to the touch, and shaped like a cone, and are proportionate in number to the subsequent pustules. In PLATE II the artist has well exhibited the developed disease, as well as the progress of the eruption from day to day.

Treatment. — Like the two preceding diseases, the ordinary, uncomplicated form of this requires only the most simple treatment. Not much is wanted, except confinement in bed, cooling drinks, cool and even temperature, frequent change of linen, and sponging the body with cool water. But when what is called the fever of invasion is past, and the eruption is *fully developed*, and has brought along with it the *secondary fever*, then some recipe, as (131), (355), (125) will be in place, and some gentle laxative to keep the bowels open (8), — also gentle injections (249), and opiates to relieve sleeplessness and nervous symptoms; (356) (357) may be used if very sleepless.

Should the system, at this period, appear to be sinking, a more generous diet, and a little wine may be allowed. If the brain suffers, apply cold ice-cloths to head, or an ice-bag behind the ears, and put the feet in a mustard bath (242). If the breaking out appears with difficulty, put the patient into a warm bath, and give extract of jaborandi (358). Gargles will frequently be needed for the inflammation, and dryness of the mouth and throat (243). Cold sponging may be considered as highly beneficial, in both the primary and secondary fever. The belladonna likewise is a useful remedy, used in the same way as in scarlet fever. The plaster (288), applied to the face, will, it is said, arrest the formation of matter, and prevent the unsightly scars which so often cover the face of persons who have suffered from small-pox. Paint the face once or twice a day with glycerine, which will effectually prevent pitting. The use of flexible collodion is better.

To avoid Pitting, and the occurrence of unsightly scars of the face, several methods of dressing have been used. The simplest consists in covering in the vesicle with iodoform-collodion, say, twenty grains of the former to one ounce of the latter. Having pricked the vesicle with an absolutely clean needle, one, for instance, that has been boiled in soda-water for five minutes, a layer of this collodion should be applied and allowed to dry on at once. Should pus form under this coating it must be released by washing off the collodion with alcohol. The wound is then to be thoroughly disin-

fectured with carbolic acid water (one teaspoonful to pint of water) and the collodion again applied.

• This process will avoid most of the pitting.

Varioloid.—*Mild Small-Pox.*

VARIOLOID, or modified small-pox, begins with symptoms similar to those of small-pox, but much milder in degree. These symptoms are feverishness, nausea, vomiting, pains in the loins and head, and a quickened pulse. The eruption comes out on the third or fourth day, and looks like that of small-pox. It reaches its height the fourth or fifth day, and then declines without any secondary fever. The pustules dry up and form brown scabs which fall off in a few days, and leave slight pits, and a few red or purple spots.

Chicken Pox.—*Varicella.*

CHICKEN-POX is a contagious disease, associated with mild fever and a blister-like eruption called blebs over the body.

Symptoms.—The disease appears usually from two to three weeks after exposure of the child to some one else similarly affected. At first a mild fever and feeling of tiredness causes the patient to stay indoors, though intense pain in the head, back and legs with high temperature, vomiting and even delirium are not uncommon.

The eruption usually appears in one to three days and are small, watery blisters averaging one-eighth of an inch in size. They are more numerous over the chest and trunk, occasionally over the face and forehead and even in the roof of the mouth. They do not have the so-called shotty feeling when pressed to the bursting point under the finger as in smallpox, neither is the red blush around them so marked.

Unless scratched by the finger nails or a very severe case, very few scars will remain.

Treatment.—The treatment is practically a mild diet for a few days, keeping the patient indoors to avoid exposure to cold or wet and some simple medicine as sweet spirits of nitre in dose of half a teaspoonful in water every three hours to allay fever and keep the kidneys working properly.

Cow-Pox. — *Vaccina.*

THIS disease exists to some extent among lower animals, and is identical with small-pox in man. The immortal Jenner taught the world that the pus taken from the cow having this disease, and introduced under the skin of man, would produce an eruption similar to that of small-pox, and that this would protect the system from the latter disease. This was an immensely important discovery, and will render the name of Jenner famous through all time.

Before this discovery smallpox killed in England as many persons

ERYSIPPELAS

PI 3



Fig 1



Fig 2

as all other diseases combined. To-day, if a person has even been vaccinated once in their life the chance of death is only thirty out of one hundred, while if never vaccinated about sixty per cent. die. If vaccinated and the "scar" is plain, not over eight per cent. die.

It is usually a wise precaution to be revaccinated once in eight years, especially if an epidemic of smallpox appears.

The Second Group of diseases, characterized by inflammation of the true skin, *without constitutional symptoms of a specific kind*, are Erysipelas, Nettle-Rash, False-Measles, and Inflammatory Blush.

Erysipelas. — St. Anthony's Fire.

ERYSIPELAS is a diffused inflammation of the skin, affecting only a part of the surface of the body, and is accompanied by a fever, which is generally thought to be infectious and contagious. The local inflammation is disposed to spread; it extends deep, and is attended by swelling, a tingling, burning, and pungent heat, and by a redness, which disappears when the skin is pressed by the finger, and returns on remitting the pressure.

Symptoms. — The constitutional symptoms are chilliness and shaking, succeeded by heat; lowness of spirits, lassitude, pains in the back and limbs, pains in the head, quick and hard pulse, thirst, loss of appetite, white and coated tongue, bitterness of mouth, nausea, vomiting, pain in stomach, and costiveness.

These symptoms go before the local inflammation several days; they increase with the redness of the skin, and disappear upon its decline. The nervous system is sometimes severely affected, and indicated by low, muttering delirium. At the close of the inflammation there is generally a relaxation of the bowels, and the scarf-skin peels off. Sometimes matter forms under the skin, and occasionally mortification occurs. The face is the most frequent seat of the disease. It commonly begins on one side of the nose, and soon spreads over one side of the face, closing up the eye, and changing the features in a shocking manner. See PLATE III, Fig. 1.

Somewhere about the third, fourth, or fifth day, very minute blisters appear on the inflamed parts, filled with water, which increases until the blisters break and let it out. The disease comes to a head on the eighth or ninth day, when the blistered parts dry, and the skin begins to peel off.

Treatment. — In the treatment two things are to be done, — to subdue the fever, and the local inflammation. The fever is assuaged by rest, mild diet, gentle laxatives (26), (21), (125); and by the use of tincture of veratrum. For the local inflammation, various things have been advised, but nitrate of silver, on the whole, has the preference. First wash the inflamed part with soap and water to remove any oily substance, and wipe the skin dry. A solution of nitrate of silver will in many cases, according to Dr. Higginbottom,

do even better. Use a solution of one dram of Argyrol to half an ounce of water that has been boiled and then cooled. Apply with a camel's hair brush over the entire inflamed area and for a small space beyond.

Apply two or three times to secure a firm coating but use carefully to avoid sloughing. A perhaps better remedy than any is to apply after washing with water and castile soap, a thick coating of ichthyol with vaseline equal parts. Cover this application with oil paper or absorbent cotton as it will stain the clothes.

In mild cases, flour may be dusted on the inflamed part from the dredging-box. Warm fomentations are also useful, and cloths wet with water, and laid on. A solution of perchloride of iron, applied to the inflamed skin, is much used now, or water as hot as can be borne.

In erysipelas the powers of the system are generally reduced, and tonics, such as quinine, wine, etc., are generally required. Dr. Robert Williams, — high authority in these matters, — says he puts his patients upon milk diet, gently opens the bowels, and gives them, daily, from four to six ounces of port wine, together with sago, and that he seldom has to change this course, whatever the symptoms.

For the inflamed skin, a tea made of buckwheat meal is a good wash. Alcohol and water, or new rum, may be used for the same purpose.

Nettle-Rash. — *Urticaria*.

NETTLE-RASH begins with fever, which lasts two or three days, when wheals of various shapes, round, oval, and oblong, appear in the midst of red, slightly elevated patches, attended by great itching and tingling, as if the common nettle had been applied to the skin. The wheals go off during the day, and come again at night. The eruption is often a symptom of other diseases, or of mental anxiety. Sometimes it is the effect of articles of diet. Children have it occasionally while cutting teeth. A lighter form of the disease exists, in which the wheals appear and disappear at short intervals, according to the heat of the weather, the exercise, diet, etc.

Treatment.— The treatment varies according to the cause of the disease. If this be anything offending the stomach, especially if it be putrid fish, an emetic (2), (4) will be required, followed by brisk physic (359). After which take a few doses of quinine (75). For external application, the lotion (216) or common vinegar and water (215) will be useful. Dr. Wilson recommends corrosive sublimate, etc. (217), as the best lotion to apply outwardly. Soda bath better.

The diet should be simple and cooling, all stimulating food and condiments being avoided. Fruit, candies, and berries often the cause.

Rose-Rash.—*Roseola.*—*False Measles.*

Symptoms.—The summer rose-rash appears first on the arms, face, and neck, thence it spreads over the whole body, producing tingling and itching. It is usually preceded by the symptoms of fever-chills, succeeded by flushes of heat, languor, pains in the head, back, and limbs, restlessness, quick pulse, and thirst. The rash appears in small irregular patches, paler than those of measles, and of a more roseate hue. There is some hoarseness from inflammation of the throat. The rash never continues more than five days, unless it be merely partial, in which case it sometimes comes and goes at intervals for weeks. If it “strike in,” it generally produces disturbance of the stomach, headache, and faintness, which are relieved by its reappearance.

The autumnal rose rash is in more distinct patches than the former, of a circular figure, slightly elevated, and of a dark damask-rose hue. Seldom any fever, or itching and tingling.

Treatment.—For the first-described form of the disease, light diet, acid drinks, and gentle laxatives; for the second, recipe 59 or 51, according to convenience.

Inflammatory Blush.—*Erythema.*

WHAT is called margined inflammatory blush, is a mottled, red, smooth fullness of the skin, occurring on the extremities and loins, in irregular patches, bounded on one side by a hard, elevated, red border. This species of disease attacks old people, and indicates some internal disorder, which is dangerous.

Another form of the complaint appears on the arms, neck, and breast, in extensive, bright-red, irregular patches, slightly elevated. The redness, at its height, is very vivid, and continues about a fortnight, when it assumes a purplish hue in the centre.

Treatment.—Light diet, gentle purgatives (21), soda bath to allay the tingling and secure sleep, and the mineral acids (63), with bitter tonics, comprise all that is required, except sponging with water, and friction.

Watery Pimples.

WE now come to a class of diseases characterized by watery pimples. Wilson says they are distinguished by “effusive inflammation of the derma,” which means that there is inflammation of the true skin, which causes water to be poured out on top of the derma, and underneath the scarf-skin, causing the latter to be lifted up in the form of small or large blisters, or vesicles. At first the fluid in these pimples is transparent, but in a short time becomes milky. Sometimes this fluid absorbs; at other times, it dries up, and with the cuticle scales off as scurf.

Eczema and Salt Rheum.

ECZEMA is an inflammatory, acute or chronic, non-contagious skin disease characterized at first by redness, little pimples, vesicles or pustules and is attended by more or less burning itching. This process terminates either in the formation of crusts as the result of dried sticky serum, or else in the formation of fine scales.

No skin disease has such a variety of aspects nor such grades of inflammation. There is generally more or less oozing of the blood-serum, which dries and thickens, forming crusts. There is usually more or less thickening of the skin, making it like leather; there is generally some considerable scaling.

Eczema may subside in a few weeks never to return, or, what is more probable, may lapse into a chronic state and continue for months and years, with bothersome symptoms, which are extremely annoying.

Salt Rheum is a chronic eczema of this last variety.

Treatment.— In the acute stage of eczema, soothing lotions, powders, or ointments should be used, such as 372, 373, 374. Some are better treated with powders, some by lotions; the itching and heat are best relieved by 373.

In the more chronic variety some stimulating ointments are needed, like 375. Carbolic acid, 10 or 15 grains to the ounce of oleate of zinc ointment, is an admirable remedy for the itching and burning. Salicylic acid, 10 grains to the ounce of benzoated zinc ointment is likewise very serviceable, while tarry preparations generally are the most satisfactory in this chronic stage.

No skin disease, however, is often so stubborn to treatment as the different forms of eczema. The cure often will be slow and medicines frequently changed. The local varieties of eczema require special treatment.

Eczema of Head in Children.— After oiling freely the crusts over night and washing off with suds in the morning, apply Salicylic acid, 1 part, tincture benzoin, 2 parts, vaseline, 50 parts. The very chronic, thick, and indurated skins require 360, and in many cases 219, especially the chronic hand-cracks. The diet must be free from irritating articles of food, the bowels regulated and the hygiene of the skin attended to, while tonics and general systemic measures are often called for.

Tetter — Shingles.— *Herpes.*

AFTER a slight feverish attack, lasting two or three days, clusters of small, transparent pimples, filled sometimes with a colorless, sometimes with a brownish lymph, appear on the cheeks or forehead, or on the extremities, — and at times on the body. The pimples are a little larger than in eczema, — about the size of a pea. After a few

days the vesicles break, pour out their fluid, and form brown or yellow crusts, which fall off about the tenth day, leaving the surface red and irritable. The eruption is attended with heat, itching, tingling, fever and restlessness, especially at night. Ringworm is a curious form of herpes, in which the inflamed patches assume the form of a ring. Shingles usually attack the aged about the ribs of one side, and are evidences of impaired health and nutrition. They are very prostrating and require tonics from the start.

Treatment.—Light diet, gentle laxatives. If the patient be advanced in life, and feeble, a tonic (75) will be desirable. For external application, belladonna (173), or an ointment of sulphuret of lime, (174), or elder-flower ointment, etc. (175). Equal parts of chloral and camphor applied several times a day, especially later in the disease (361), give most relief.

Itch.—*Scabies*.

To this disease all classes are liable, though it is much less common than in former years. It is found frequently among the poor, whose condition in life does not give them the means to guard at all points against it; but it is most common among such as neglect personal cleanliness.

Symptoms.—An eruption of distinct, cone-like, watery pimples, which are transparent at the summits, and are accompanied by an excessive itching, which is made worse by high-seasoned food, by drinking liquor, and by the heat of the bed. When these pimples are scratched and torn, a sticky, watery fluid is poured out, which forms small scabs; and, in time, if the disease is not cured, these scabs being torn off, extensive sores are made.

Cause.—It will excite the wonder of many readers to state that animals of so small a size as scarcely to be seen with the naked eye exist in the skin of man. Yet such is the fact; and it is the presence of these minute creatures, or the effect of their presence, which constitutes the disease called itch. The little creature (*acarus scabiei*, by name), a species of *mite*, is one seventy-seventh part of an inch in length; and when closely inspected under the microscope, is really a beautiful, I may say an elegant, animal. Here are a front, a side, and a back view of him, well done by the artist.

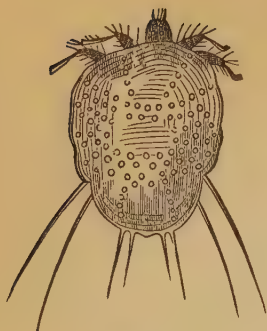


FIG. 73.



FIG. 74.

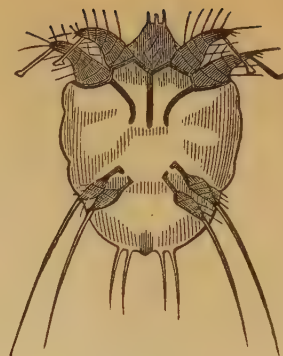


FIG. 75.

His Method of Attack.—When placed upon the skin, the little fellow, like the squirrel and other ground-animals, sets himself to make a hole through the scarf-skin with his head and fore feet. Into this he pushes his whole body. He then begins to burrow himself in the derma or true skin — making a channel many times his own length, at the end excavating a chamber where he sleeps, and whence he goes out to do his day's work at mining, or boring for food. When tired of this sleeping apartment, he digs onward and scoops out another.

This travelling, and boring, and turning about in an organ as sensitive as the true skin, must, of course, occasion a tickling and *itching*; and from this circumstance the disease took its name of *itch*. But this itching is not painful. James the First is said to have remarked that the itch was fitted only for kings — so exquisite is the enjoyment of scratching. Probably it is a royal luxury. Be that as it may, most persons would consent to have it all done by royal fingers. They have been used for meaner purposes.

Treatment.— Whatever will kill the little animal described above, will cure the itch. Various agents have been employed for this purpose, but none have been found equal to sulphur. The compound sulphur ointment is a sovereign remedy for the disease. Four ounces of this should be well rubbed into the skin, before the fire, morning and evening, for three or four days. This will put an end to the whole colony of these sovereign squatters upon forbidden soil.

Two ounces of sulphuret of potash, and the same amount of soft-soap, dissolved in a pint of water, and applied well to the skin, is used in many cases with good effect.

Caustic potash, one part to twelve parts of water, applied in a similar way, is said to be a pretty sure remedy.

A solution of the chloride of lime, used as a wash, will often effect a cure.

The ointment of the American hellebore sometimes does well.

Before applying any of these preparations, let the skin be washed with warm water and soap, and well dried. Be sure the parasite is

killed before ceasing treatment. Best to continue few days longer than what is apparently needed.

Rupia.

THIS is from a Greek word which means dirt, from the dirt-colored crusts which are formed after the breaking of the large watery pimples. The vesicles are like those of eczema and herpes, except that they are *larger*. This is distinguished from all other skin diseases by the formation of unhealthy, foul, and burrowing sores, which pour out a reddish matter in such quantities that it collects and dries upon the sore, and forms a crust of great thickness, — sometimes of the size of an oyster-shell. Rupia has its origin in a weakly and debilitated constitution, and cannot be cured without renovating the whole system. It is a manifestation either of syphilis or lupus.

Treatment.— Warm baths once or twice a week, with generous and nutritious diet. Tonic medicines (63) (51) (67) (61) (65) will be required. For external treatment, dust the surface of the ulcers with cream of tartar, or apply nitrate of silver (214) (219) (220), white vitrol, etc. See syphilis.

Pemphigus. — *Pompholix*.

THE first of these terms is from the Greek, and means a *bubble*; the second, pompholix, is from the same language, and means a *water-bubble*. This is still more applicable to the disease in hand, which consists, in fact, in the raising up of the scarf-skin in the shape of bubbles, containing a watery fluid. These bubbles are just like common blisters. They vary from the size of a split pea to that of a hen's egg. They rise up very rapidly, and break in two or three days, leaving a raw surface which soon becomes covered by a thin crust.

Treatment.— Similar to that for Rupia, with the addition of iodide of potassium (140), and applying the stick nitrate of silver to the whole surface of the ulcer, and a short distance beyond it on all sides, or the ointment (176). See treatment for syphilis.

Matter Pimples.

ANOTHER natural group of skin diseases are distinguished by an eruption of pimples, filled, not with water, like those just described, but with matter. The pimples of this class are not transparent, or whitish, but *opaque* and *yellow* from the first. The matter is poured out upon the true skin, and raises up the scarf-skin, in the same way as the watery pimples. As in the preceding diseases, too, the drying up of the matter forms crusts. But these pimples are never so small as those of eczema, nor so large as those of pemphigus.

Crusted Tetter. — *Impetigo*.

THIS eruption consists at first of slightly-elevated pustules or pimples, closely congregated, with an inflamed border. These break, and the surface becomes red, excoriated, shining and full of pores, through which a thin, unhealthy fluid is poured out, which gradually hardens into dark, yellowish-green scabs. These scabs sometimes look like a dab of honey dried upon the skin. This has given impetigo the name of "honey disease," or honey scab. This honeyed look is well represented in the crusts which form on the lips and ears of children. Sometimes these scabs cover nearly the whole face, and are called the milk crust. This is putting the agreeable words *milk* and *honey* to rather questionable uses! When this crusted tetter invades the head or scalp, it causes the hair to fall, and becomes what is called a *scall*. Impetigo may be simple, or contagious, or syphilitic.

Treatment.— The vapor bath, and water dressing. The following ointments are useful: oxide of zinc, white precipitate, or diluted nitrate of mercury (178). Hydrocyanic acid (221), applied externally, has a fine effect. The crusts should first be removed by a weak lye made from hard-wood ashes, or potash; then, after applying one of the ointments above, or the lotion, cover the part with oil-skin. If the crusts are on the head, the hair should be cropped off before the remedies are applied. When of syphilitic origin, treat as for that disease.

Papulous Scall. — *Ecthyma*.

THE mattery pimple called ecthyma is developed on a highly inflamed skin. The bladders are about the size of a split pea, and are surrounded by a broad ring of redness. They are generally separate, not clustered like impetigo. They are scattered over various parts of the body, and are followed either by a hard black crust, or by a sore. The disease is either acute or chronic. The latter attacks weakly children, and persons reduced by sickness or low living.

Treatment.— For the acute form, give a generous diet, with ointment (176), and the cold sponge-bath on the sound parts. Use (176) (175) (214) (211) for external application. Hygienic treatment, tonics, and stimulants are called for; iron, quinine, arsenic, and nux vomica.

Scaly Eruptions.

THE scaly eruption is called a dry tetter. It is an inflammation of the true skin, and is distinguished from the rashes and pimples by the alteration of the scarf-skin. The diseases forming this group are three in number,—*lepra*, *psoriasis*, and *pityriasis*.

Leprosy. — *Lepra*.

IN this disease, the eruption makes its appearance as a small, salmon-red spot, raised a little above the surrounding skin, and constituting, in fact, a flat pimple, almost as large at the top as at the bottom. On top of this pimple the scarf-skin becomes rough, and after a little while a thin scale is produced. New layers are added to its under surface, and it accordingly grows thicker. It has a bright, silvery lustre. These scaly spots multiply, and become the form of leprosy called *lepra guttata*, from the Latin *gutta*, a drop, the scales looking like drops of water on the skin.

But the eruption more frequently spreads out into circular patches, of the size of a fifty-cent piece. These generally appear below the elbows and knees, and on the breast and shoulders, and back of the hands. Sometimes the entire hand is covered with scales of a peculiar silvery whiteness. These patches heal from the centre.

Psoriasis.

THIS differs from lepra in the eruption being more irregular. The spots sometimes come out in thick clusters, and blend in various ways. Instead of appearing in distinct circular forms, as in leprosy, the patches are irregular, and of every size. Instead of one well-formed and thick scale, there are many small and thin ones. And instead of a depressed centre with rising edges, the surface is level. While leprosy is a circular dry tetter, this is an irregular dry tetter.

Treatment.—Pyrogallic acid in ointment, 10 to 40 gr. to oz. Apply daily; it discolors the skin for a while. Chrysophanic acid in same strength is the best remedy known. It also discolors the skin and inflames the neighboring skin for a while. Recently the thyroid gland of the sheep has been used in five-grain tablets three times daily as an internal medicine with much success.

Pityriasis.

THIS is much like the two preceding, except that it gives rise to a copious production of very small bran-like scales. Indeed, its name is from the Greek, and means chaff or bran. It is a branny tetter. It may occur on any part of the body.

Treatment.—When the skin is highly inflamed and stiff with heat, pain, and itching, the diet should be light, and the drinks of a cooling and unexciting kind. The warm bath and gentle friction of the skin are useful. Laxatives or tonics may be employed, according to the indications,—frequently laxatives first, and tonics afterwards. The specific remedies for curing the disease are unknown; iodide of potassium (140), arseniate of iron (68), Fowler's solution, in two-drop doses, three times a day; or Donovan's solution, in five-drop doses,

three times a day. For external application, use a naphthaline ointment (177), zinc ointment, white precipitate ointment, diluted nitrate of mercury ointment, or solution of corrosive sublimate (212).

Dry Pimples.

THESE are distinguished by the high degree of irritation of the skin which they create. They are exceedingly troublesome, not only from the distress and itching they occasion, but because they are likely, in consequence of this, to be torn into painful and obstinate sores.

When appearing in children, they are called *red gum*, and *tooth-rash*. In grown persons, one form is named *lichen*, and another, distinguished by excessive itching, *prurigo*.

In this form of pimples, the fluid is not poured out upon the *surface* of the true skin, — as in several of the preceding diseases, — but is collected within the tissue of this organ, and the pimples feel hard under the finger.

The tooth-rash of infants is always accompanied with some feverishness, caused generally by irritation of the gums from growing teeth, occasionally by flannel worn next the skin.

Lichen has a variety of forms. In one case the pimples are of a bright red, in another, bluish or livid. In one case they appear in circular groups, in another they produce great disorganization of the skin, and occasion terrible suffering.

Prurigo is a still more cruel disease than lichen. The pimples are not very manifest, but the skin is thickened or swollen, and condensed. The suffering from it is terrible. It gives one no sleep, night or day. That form of it called ant-bite prurigo gives the sensation of millions of ants eating the flesh, or as many red-hot needles piercing it. This renders the existence of many elderly persons a terrible burden.

Treatment.—Careful diet, and gentle aperients and tonics, according to the condition of the system. Externally, the cold salt-water sponge-bath, and glycerine, vinegar and water, applied with a soft sponge. Tar and sulphur are among the more successful remedies in fighting this rebellious disease (362). Iron, quinine, cod-liver oil. For relieving the terrible itching of the private parts, which females sometimes suffer, I have found morphine (223), for external use, very effectual.

Lupus.

THIS makes its appearance in the form of one or more circular elevations, of a dull red or salmon-color, and partially transparent. When pressed under the finger, these elevations are found to be soft,

and when the finger is removed, they are flat and whitened. They generally appear on the face, and particularly the nose.

In another and worse form of the disease, the tubercles are harder; and after a time, they become covered with thin brown scabs, which are scratched off, and followed by others, and these by others, until ulcers appear, which are sometimes slow and sometimes rapid in their progress. The whole nose has been destroyed by them in a month. (See Fig. 76.) This is one of the diseases which Erasmus Wilson thinks, and, in my judgment, correctly, to be, like scrofula, the result of tubercular poison, filtered through the blood of several generations. It is a disease which is the most destructive in the shortest time of all diseases.

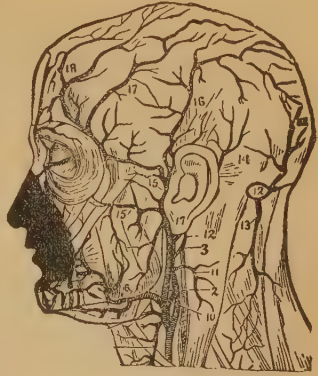


FIG. 76.

Treatment.— The internal remedies are iodide of arsenic (141), and iodide of potassium (140); the external, vinegar of Spanish flies; and to promote the healing of the ulcers, a weak solution of nitrate of silver (211) (214) is adapted.

Hardly any disease has been treated by so many different remedies. At present the prospect of a cure is good, as certain anti-tubercular lymph injections have been found effective; but no time should be lost in immediately consulting a surgeon, as its growth can be arrested, and the disease may be exterminated by early treatment.

Warts and Corns.— *Verruca* — *Tylosis* — *Clovus*.

In the derma or true-skin there are a great many small arteries, veins, and nerves, united together, and formed into loops (see Fig. 43), resembling, in shape, the peaks of miniature mountains. These are called *papillæ*. These loops, frequently, without any apparent cause, take on a disposition to grow, and by extending themselves upward, they carry the scarf-skin along with them, which is thickened; and together they form what is called *warts*. Corns are formed by a somewhat similar growth of the *papillæ*, brought about by the pressure and friction of tight boots and shoes.

Treatment.— For warts, take a piece of diachylon plaster, cut a hole in the centre the size of the wart, and stick it on, the wart projecting through. Then touch it daily with aqua fortis. Nitrate of silver sometimes answers well for touching it. They may be taken off very neatly, sometimes, by tying a string tight around them. Corns should be shaved down close, after being soaked in warm

water and soap, and then covered with a piece of wash-leather, or buckskin, on which lead plaster is spread, a hole being cut in the leather the size of the corn. They may be softened, so as to be easily scooped out, by rubbing glycerine on them. Manganic acid destroys warts and corns rapidly. Bunions, which affect the joint of the great toe, must be treated with fomentations, and sugar of lead water (224), when there is considerable inflammation, with rest in a horizontal position. But the best cure for corns and bunions is to put away tight shoes. Wear a bunion-plaster for some time to take the pressure off of the corn or bunion.

Mother's Marks.—*Naevus*.

THE small vessels of the skin, called capillaries, suffer certain alterations of structure which pass under the name of mother's marks. These marks are simply a great dilatation of these minute blood-vessels. They vary in size from a mere point to a patch of several inches square.

The smallest of all is the *spider mark*. It is a small red point, from which several little straggling vessels spread out on all sides. Sometimes this is of the size and appearance of a red currant; at other times, of a strawberry or raspberry; and occasionally it is even much larger, and is compared to a lobster.

When the circulation is active through them, or the individual is excited by exercise, or by moral causes, these marks are of a bright red color. Some are naturally livid and dark-colored, and look like blackberries, and black currants. The blueness of these is owing to the vessels being still more stretched and dilated, and to the consequent slower passage of the blood through them, which gives more time for its change from the arterial red to the venous blue.

Treatment.— If the mark is not making progress, it had better be let alone, or only subjected to gentle pressure by putting a piece of soap-plaster over it. When its course is threatening mischief, it is sometimes cured by pencilling a small portion of its surface, from time to time, with nitric acid. They may be operated on with safety by electrolysis and other methods.

Disordered State of the Nerves of the Skin.

Itching.— *Pruritus*. This is supposed to be dependent on an altered condition of the nerves of the skin, and consists in a painful sensation of itching. There is no perceptible alteration in the appearance or structure of the skin. This itching is thought, generally, to be a result of sympathy, through the nerves, with some diseased and excited condition of a distant part. The itching is brought on by the most trifling causes, and for hours may deprive the sufferer of every particle of repose. It more frequently affects the fundament, or the private parts, particularly the scrotum.

Treatment.—As this disease is only a symptom of several others, the constitutional treatment belongs under the heads of these other diseases. The local applications for relieving the itching are, a solution of sugar of lead (224), hydrocyanic acid (363), of corrosive sublimate (212), diluted nitrate of mercury ointment, and poppy fomentations. Also (223). Tonics are often of first importance. Weak solutions of carbolic acid or soda water at times suffice.

Disorders Affecting the Color of the Skin.

Colored Patches.—*Maculae.* The depth of color in the skin depends on the amount of a certain coloring matter, called pigment, incorporated with the deeper and softer portion of the scarf-skin. In the scarf-skin of the inhabitants of northern latitudes, there is but little of this pigment; in that of the dwellers of Africa, there is a great deal; among the inhabitants of Southern Europe, the quantity is intermediate between the two.

The depth of color in the skin depends on the energy of its action. In the tropics, where light and heat are in excess, the skin is stimulated to great action, just as vegetation is, and the color is increased and intensified. This is illustrated every year before our eyes. In summer, under the heat of the sun and the flood of light, the pigment-forming power is increased, and the fairest skin is browned; while the withdrawal of these forces leaves the winter's scarf without pigment, and blanched.

What the sun and light do, under natural circumstances, diseased action may effect. Hence we occasionally meet with alterations of color in the skin, from a disordered state of the system. We witness the formation of patches of dark color and irregular shape on various parts of the body. Sometimes they are raised above the level of the skin, and are called *moles*. At other times, they have no elevation, and spread over the whole body.

Occasionally, from some peculiarity of constitution, the pigment is diminished, and white patches appear all over the body. At other times, a black person will become completely white. Such are called *albinos*.

In many cases the coloring of the skin has *varieties* of tint, as when persons of light complexion, are, in the summer season, covered with yellow spots, like stains. These spots are known by the name of *freckles*, or, in learned language, *lentigo*.

Treatment.—It is generally best not to meddle with a mole. If it be very unsightly, let it be removed by two incisions, taking out an elliptical portion of skin, and closing the wound with sticking plaster. In the case of bleached places, apply the shower bath, tonics, and a stimulating liniment (163) to the faded spots. For the change of color called sunburn, a liniment (191) of lime-water, etc., is the best preparation. For freckles, use recipe 360, or, perhaps, still better, 364.

Disorders of the Sweat-Glands.

THE perspiration is sometimes greatly increased above nature's design. This is, technically, *idrosis*. In other instances there is too little sweating. This is called *anidrosis*. Sometimes the perspiration is so altered in its physical qualities as to have some peculiar smell. This is *osmidrosis*. In some rare instances, according to old writers, the sweat was changed in color. This was *chromidrosis*. And now and then a case occurs of bloody perspiration, of which the most memorable case on record is that of the Redeemer of men, who, in the garden, sweat great drops of blood. Several cases of this are recorded in medical books. It is called *hæmidrosis*.

The proper action of the skin being so vitally important to health, these changes often involve very serious consequences.

Treatment.— Either too much or too little sweating can generally be corrected by the cold or warm bath, friction, tonics, and proper clothing. Small doses of jaborandi, also ergot and strychnine, are among the best internal medicines (365).

Disorders of the Oil-Glands and Tubes.

THAT the skin may be limber, healthy, and fit for use, it is necessary to have it oiled every day. For this object, the Creator has wisely provided, by placing in the true skin a large number of very small glands and tubes, whose office it is to prepare and pour out upon the surface the proper amount of oil. The gland, regular little oil-pot, is in the true skin; and from it a piece of hose or tube runs up through the scarf-skin, through which the oily fluid is poured out. Some of these tubes are spiral, others are straight. On some parts these vessels do not exist; on others they are quite abundant,—as on the face, nose, ears, head, eyelids, etc. They produce the wax of the ears; and on the head, they open into the sheath of the hair, and furnish it with a hair-oil or pomatum better than the chemist can make.

These little vessels are always at work, when the skin is healthy; and no persons need be afraid to wash all over every day, lest, as the *Boston Medical Journal* taught, the skin will be injured by having the oil removed from it. You might as well be afraid to eat a meal of victuals, lest the saliva should all be swallowed with it, and none be left for future use. There is oil enough where that upon the skin comes from, and the vessels which produce it are not injured by work, any more than the muscles of the legs are by walking.

Grubs or Worms.— But, unfortunately, the skin is not well taken care of in all cases, as in cities and towns where sedentary habits prevail. Here, the actions of the skin, instead of being regular and complete, are often sluggish and imperfect; and the contents of the oil-cells and tubes, instead of flowing easily, become hard and impacted, and the vessels are not emptied. When this matter becomes station-

ary, dry, and hard, it distends the tube, and fills it to the surface; and then coming in contact with the dust and smoke of the atmosphere, the ends become black, and look like the heads of worms. These spots are common on the nose and face of persons who have a sluggish skin. They may be squeezed out by pressing the nails on each side of them. These are called *grubs* and *worms*, or, technically, *comedones*. When this matter produces inflammation of the tube, there is then a black spot *in the middle of a red pimple*, and the disease is called *spotted acne*.



FIG. 77.

Now and then the oily matter becomes very hard, producing spine-like growths, and even horns (Fig. 77); and again, it collects and forms soft tumors, as wens, etc. These are technically called *encysted tumors*. Sometimes the action of the glands is too great, and oil is poured out so profusely that the face shines with it. At other times there is so little that the skin is dry and harsh. In the hardened oily matter, which constitutes grubs, are found small animals, which Dr. Wilson calls the "animal of the oily product of the skin."

Below are the three views of him.

Treatment.—For roughness and harshness of skin, wash with soap and water every night, and rub well into the skin after the bath, and in the morning, the ointment (362), and take a dose of sulphur, etc. (23), twice a week. Or, rub the skin every morning with a damp



FIG. 78.



FIG. 79.



FIG. 80.

sponge dipped in fine oatmeal, and after drying the surface, the liniment (164) may be applied. The spinous variety, or porcupine disease, requires washing with a quart of warm water, having a large

teaspoonful of saleratus dissolved in it, and the use of the ointment (181) twice a day. For grubs, stimulate the skin by washing it with strong soapsuds, twice a day, and rubbing briskly with a coarse towel; and by using the corrosive sublimate (225) as a lotion.

A spare diet will do much towards improving the skin in many cases; use tonics in others. Usually, destroy the old skin first (360) and apply after (362) to heal.

Barbers' Itch. — Jackson's Itch. — *Sycosis*.

THIS is very much like *acne*, — only differing from it in its location. It appears chiefly on the hairy parts of the face, — the chin, the upper lip, the region of the whiskers, the eyebrows, and the nape of the neck. It consists in little conical elevations, which mature at the top, and have the shaft of a hair passing through them. These pimples are of a pale yellowish color. In a few days they burst, and the matter running out, forms into hard, brownish crusts. These crusts fall off in one or two weeks, leaving purplish, sluggish pimples behind, which disappear very slowly.

The eruption is preceded by a painful sensation of heat, and tightness of the skin.

Barber's Itch.

BARBER'S ITCH is a variety of ringworm though confined to the region of the face covered by the beard. Whether of the body, the scalp or the face, this disease is highly contagious, being communicated to other persons through the medium of soiled hands, unclean towels, razors, strops, brushes, etc. A vegetable fungus called the trichophyton is the source of the infection.

Symptoms.—Small reddish pea-sized rings with minute vesicles or watery blisters appear, they spread, branny scales form, the blisters mature, itching becomes noticeable and other areas rapidly take on the same appearances. The surrounding skin becomes congested and reddened, a gluey, yellowish, sticky fluid exudes from the scabs and thicker crusts pile up on each other. The hairs of the affected part break off very easily or fall out.

As this disease is so contagious, great care should be taken to use individual towels, that the face should be shaved if possible by the person afflicted and of course kissing the children or holding their cheeks up against the infected cheeks must be prohibited.

Treatment.—Although a tedious course may be expected to present itself, yet the greater the care used the sooner a cure will be effected. First with almond or olive oil soften the parts for two days, then shave every day or at least every other day, and after washing off with warm water apply freely an ointment of twenty grains of sulphur, fifteen grains of boracic acid mixed in half an ounce of benzoinated lard. This salve should be well rubbed in and a supply kept on the face, enough to make it look greasy day and night until cured.

Disorders of the Hair and Hair-Tubes.

THE hair is an appendage of the scarf-skin, and is intended to be both useful and ornamental.

It is subject to several disorders. It may grow too long, or too thick, or it may appear in an improper place. This last happens in the case of those little spots and patches which disfigure the face, and are called *moles*. The hair may be defective in its growth, or may fall off prematurely from various causes, or in the natural course of things from old age. This last is called *calvities*. It may change its color, too, under a great variety of circumstances, and at nearly every age. It is not very uncommon to find a single lock varying in color from that which surrounds it. Old age, the winter of life, naturally brings the frosted locks; but they frequently appear also upon the heads of younger persons. Strong mental emotions, such as fear, grief, or sorrow, may bring a bleaching of the hair in a brief period, or even suddenly.

Porriigo.—There is a troublesome disease of the hair and hair-tubes called *porriigo*. It begins with the formation of a thin layer of scurf either around single hairs, or in patches which enclose several. These patches frequently have a circular form, which give to the affection the character of a *ringworm*. The hair-tubes are generally a little elevated, in the shape of papillæ, which gives to the diseased scalp the appearance of “goose-flesh.” These hairs, losing their proper nourishment and healthiness, break off at unequal distances from the skin, leaving their rough ends twisted and bent, and matted into thick grayish and yellow crusts. Upon the surface of these crusts may generally be seen the ends of a few hairs, looking like the fibres of hemp or tow. The scratching causes inflammation of the skin after a time, and matter is poured out, which still further mats the hair, and thickens the crusts. There are several varieties of this disease, differing slightly from each other; but this general description will answer all practical purposes for this work.

The reader will often notice a disease of the hair-glands, characterized by a yellowish and dirty-looking powder, covering the scalp and hairs. This matter is collected at the mouths of the follicles, and considerable of it is strung upon the hairs like beads. Pull out a hair, and the root will be found thin, dry, and starved in its appearance. In this disease, it is difficult to keep the hair cleansed, or to prevent its falling off.

Favus.—Still another disease, called *favus*, is known by the collection of a yellow substance, at first, around the cylinder of the hair. This substance, after a time, spreads out upon the scarf skin, and dries into yellow crusts, in the form of a cup, around the base of each hair. A number of these cups, collected together, look like the cells of a honey-comb. This disease is contagious, and is communicable by contact to any part of the skin.

Treatment.— For removing the hair from particular parts of the scalp, it is common to resort to *depilatories*. Of these, the recipes 260, 261, 262, are frequently used, and are as good as those advertised; indeed, they are the same. Forceps are the best means.

To prevent loss of hair, and to restore it when lost, the circulation should be stimulated in the small vessels of the scalp. With this view, washing the head every morning with cold water, drying it by friction with a rough towel, and brushing it to redness with a stiff hair-brush, are excellent. To these should be added some stimulating ointment (183), or liniment (257), (258), (259). These last are about the best known preparations for causing the growth of the hair.

Ringworm of the scalp requires attention to the diet, and such remedies as will improve the general health, with stimulating applications externally (257), (258), (259). 366 is the newest and best mode.

To color the hair, several preparations are used. Of these, 263 is about the best. It produces a beautiful black. A preparation of sulphur and sugar of lead (264) is the famous compound recommended by General Twiggs, and extensively used. Preparations of nitrate of silver (265), (266), (311) are much in use in some quarters. They perhaps give a finer black to the hair, but they render it dry and crisp, and they will stain the skin, if care is not used in applying them.

Use care in the use of these remedies.

In Favus, the two great objects to be gained are, to remove all local causes of irritation, and to excite the diseased hair-glands to healthy action. The first object is affected by cutting off the hair with the scissors, and removing the crusts by washing the scalp with castile soap and water. It may be well first to wet the crusts through with corrosive sublimate (212), in weak solution. The washing with soap and water should be repeated every day, and be followed by rubbing into the scalp a stimulating ointment (183). A very weak solution of the nitrate of mercury (226), applied every other day, with a camel's hair brush, sometimes produces excellent effects.

Lice.

Pediculosis or Lice is a contagious, animal, parasitic affection, characterized by the presence of pediculi in the skin and scratch-marks of the sufferer ensuing from the annoying itching. There are a number of varieties classified according to the peculiar parasite and its location. They all cause great discomfort and itching.

The Pediculosis Capitis, or head-louse, is found in the scalp, and is a long, oval body with six legs furnished with nails; it has an oval head with two prominent eyes and two horns. The ova or *nits* are



FIG. 81.
HEAD-LOUSE.

small whitish bodies closely glued to the hair and look like small pieces of dandruff. One or two are deposited on a hair.

They occur for the most part in poorly nourished children brought up under bad hygienic surroundings, and thence communicated to others. They cause extreme itching and scratching, so that often the irritation is unbearable and the sticky serum of the blood mats together the hair, forming crusts. Sleep is often interfered with and ill health results. (See Fig. 81.)

Pediculosis Corporis, or body-louse, is generally the property of the clothing; it is somewhat larger than the head-louse and deposits its



FIG. 82.
BODY-LOUSE.

eggs in the seams of the clothing, remaining on the body only long enough to gain sustenance. The young are hatched in five or six days. The louse reproduces again in eighteen days. As the parasite crawls about it produces extreme itching and the scratching follows, resulting in long lines of excoriation. The chief locations for this parasite are the back, chest, abdomen and thighs. The middle-aged and elderly are more apt to be attacked than the young. Here uncleanness again is a prime factor in their occurrence. (Fig. 82.)

Pediculosis Pubis, or crab-louse, is a smaller, shorter, stouter parasite than the two preceding, and attacks the pubes particularly, but is also found in the axillae and over the eyelashes and beard of the male. They may be seen clinging closely to the skin with remarkable tenacity. They occur on adults and produce the same lesions as the other varieties. They are generally the result of promiscuous sexual intercourse. (Fig. 83.)



FIG. 83.
CRAB-LOUSE.

Treatment.—The main object in the treatment of these filthy diseases is the destruction of the parasite. The lesions they produce disappear with the disappearance of the animal. It need hardly be said that strict cleanliness of person is a *sine qua non*. The remedies usually employed in their extermination are the mercurials, sulphur, carbolic acid, tobacco, etc.

In case of the head-louse the most efficacious method of treatment consists in saturating the head over night

with petroleum and washing off with soap in the morning. In young children the hair may be cut to get rid the more easily of the nits, but this is not necessary. The applications of petroleum may have to be repeated several times and the hair frequently washed with soft soap, soda washes, vinegar, etc., to get rid of the nits. If the louse be of the body variety the treatment must be directed to the clothing, which is to be changed often and either boiled or baked. This process is to be repeated until no more parasites are found. The itching of the body is best allayed by carbolic acid lotions (one teaspoonful to pint of water).

The crab-louse is best treated by the well-known mercurial ointment, or blue ointment, and is to be washed off with soap and water each morning. It must be persisted in till no more crabs are found and no further itching is noticed.

Bed-Bugs.

THE best preventives against these annoying bugs is corrosive sublimate and pyrethrum powder. Purchase a small bottle of the corrosive sublimate tablets, usually sold at the druggists for surgical purposes, and dissolve one in a quart of water. This solution is to be freely used about the cracks of the bed, after it has been taken apart, and also about any wooden furniture of the room as well as the woodwork of the room. The powder is then to be used freely. This process is to be repeated several times.

The bites themselves are best relieved by carbolic lotions, vinegar and water, ammonia and water, etc.

Freckles.

THIS is a disease of the pigment layer of the skin and consists in a deposit of the coloring matter of the skin in irregular shapes, of the size of a pin-head or pea, and are yellowish, brown or even blackish, occurring for the most part on the face and back of the hands. They may be few and scattered or exceedingly abundant and cover a large area. All ages are subject to them except in very young children. The light-complexioned are more subject to them, while the red-haired seldom escape them. Sunlight develops them so that many have them conspicuously only in summer. The possession of freckles is a matter greatly of idiosyncrasy, as many people never have them, no matter how much they may be subjected to the sun.

Treatment.— One's aim in treatment should be toward destroying the pigment layer by some corrosive agent, like corrosive sublimate, which perhaps is the best remedy.

Two grains to the ounce in water will in most cases prove sufficiently strong. The susceptibility of the skin to this remedy and the extent of the area involved have much to do with the strength of the

remedy employed. This remedy is poisonous and is to be used with care. Do not get it near the lips, but to effect a cure it must be persisted in for quite a while.

Washing the face in buttermilk several times a day is excellent.

Corns.

OF all the minor ailments of the human body, few are more distressing than the inflamed corn. They consist of a thickening of the outside or horny layer of the skin. As a secondary change, consequent on long irritation, the nerve and blood supply increase and an extreme tenderness is produced, amounting often to incapacity to walk or work. They are caused mechanically by the undue pressure of the boot against the joint or by one toe pressing against another. Too short a boot, which causes pushing out of the big toe joint, too narrow a boot, causing crowding of the large joints, are the more frequent causes of the corn.

Bunion.

THE bunion is produced by wearing too short a boot, as a rule, and consists in the gradual displacement of the big-toe joint, so that finally there is an actual deformity. The corn usually is added to this deformity.

Treatment.—The outer layers of the corn should be softened and scraped off by a sharp, thin knife. The softening process may be effected by soaking in a soda solution, or better still, by the following mixture:—

Salicylic acid	20 grains
Extract cannabis indica	10 grains
Flexible collodion	2 drams

This is to be applied each night. Care is to be exercised in not paring the corn too closely lest bleeding occur and poisoning ensue from the unclean knife that may be used. Pressure of the boot must be avoided by the substitution of another form of boot and also perhaps by wearing a plaster with a hole in the center, thus distributing the pressure over a greater area. When trimmed the corn is to be likewise covered by a corn-plaster bound on the foot by strips of adhesive plaster. Painting with iodine often takes out the soreness and hardens the skin so that it may be more readily cut. Inflamed corns should be poulticed and treated like any pus wound. Spirits of turpentine will often take the soreness out of a corn. Absorbent cotton, or better, wool, worn between the toes, will prevent or cure a corn between the toes.

Dandruff.

THIS is a disease of the sebaceous glands of the scalp, characterized

by a large secretion of the sebaceous matter and forming crusts or scales. The secretion may be so thick and oily as to mat together the hair, or so dry as to fall off the head in a shower when the head is combed. It is the most frequent cause of baldness. The crown of the head is the most frequent location of this disease.

Treatment. — Inasmuch as those subject to this disease are often below par in health, such constitutional remedies as cod-liver oil and iron are valuable adjuncts in bringing about a cure. Should the amount of scales be considerable, especially if there are crusts, as in the case of little children, the best procedure consists in oiling the scalp over night with some bland oil, wearing a flannel cap, and washing off the oil in the morning with soft-soap and water. The following blood tonic is an admirable one for adults: —

Tincture of iron	one ounce
Dilute phosphoric acid	one ounce
Syrup of lemon	two ounces

Take one-half teaspoonful in a wineglass of water three times daily. Use a glass tube to avoid staining the teeth. The scalp needs a shampoo once or twice a week; the following will be found to be a suitable one: —

Green soap	eight ounces
Alcohol	four ounces

Put a little here and there over the scalp and then rub up with warm water. The scalp may then be stimulated night and morning with a little of the following lotion: —

Tincture of cantharides	three drachms
Tincture of capsicum	three drachms
Castor oil	two drachms
Alcohol	two ounces
Spirits rosemary	two ounces

Another good remedy for daily use: —

Hydrate of chloral	two drachms
Water	four ounces

The yolk of two eggs well rubbed into the scalp and afterwards washed off with hot water is also a good cleansing agent and shampoo.

For very stubborn cases the following lotion applied night and morning will be found efficacious: —

Corrosive sublimate	12 grains
Glycerine	4 drachms
Alcohol	5 ounces
Spirits rosemary	4 drachms

Whatever method is pursued, the application must be persevered

in and applied from twice daily to once every few days according to progress made and severity of case.

Baldness.

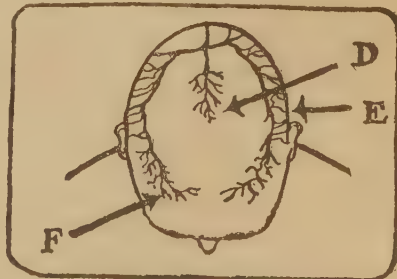
A good head of hair exists where a proper supply of good blood nourishes the hair roots in the scalp. The scalp is nourished by means of blood irrigation from many groups of veins and arteries. Therefore it is necessary that the health be preserved, which means pure blood—that the head be kept clean and absolutely free from dandruff and the dandruff germ so called—again if a hat or any head covering *compresses* the veins and arteries of the scalp, the blood cannot reach the hair roots and they become sterile and fall out; for healthy hair will not fall out. Hair is for protection of the scalp—it is wrong to crop it, shave it or to put on strong washing solutions that take away the oily substances that furnish the life of the hair itself. Therefore, preserve the health—keep out dandruff by washing the head once a week with warm water and pure oil or castile soap, rub dry with rough towel, then massage the scalp with vaseline—and wear a loose soft hat (avoid the derby or silk hat). For scalp diseases see page 179.

When once the scalp is clean and the dandruff is cured the following lotion will be found to be of great value in those cases of baldness characterized by the hair falling out in small patches:—

Carbolic acid	one drachm
Alcohol	one and a half ounces
Castor oil	two drachms
Oil bitter almonds	ten drops

The following lotion also contains desirable ingredients:—

Tincture cantharides	one and a half ounces
Tincture capsicum	one and a half ounces
Castor oil	two drachms
Cologne	one ounce



A and B, Where Baldness Begins; C, How Hats Bind the Head; D, E and F, Ends of Tiny Arteries Where the Blood Supply is First Stopped by Pressure.

Gypsy Moth and Brown Tail Moth.

A Harvard professor brought the eggs of the Gypsy Moth to Medford, Mass., about 1868, to endeavor to cross-breed them with silkworms. In 1890 the Gypsy Moth increased to such an alarming extent that thousands of acres of trees and bushes were defoliated—they covered the roads and sidewalks and furlined the walls of houses.

Fortunately the female cannot fly, but the eggs are transported on cordwood, lumber, freight cars, etc., and the female moth attaches itself to motor cars, wagons and even pedestrians and drops off to spin its cocoon wherever convenient, there to breed countless thousands to grow, and breed and destroy, until the infestation has covered an area of nearly 3000 square miles. The State and Government authorities have spent millions of dollars to check and destroy the Gypsy Moth and Brown Tail Moth.

The Brown Tail Moth was brought to Somerville, Massachusetts, (a suburb of Boston), about 1889 from Holland, probably by accident on some bush. In about ten years it had spread *all over* New England, for the female as well as the male is very strong in flight and sometimes is carried hundreds of miles by a high wind. This moth is very destructive and devours over eighty-five varieties of vegetation, besides being a scourge to mankind on account of the "**Brown Tail Rash**," caused by the small hairs of the caterpillar, and some say from the moth, which are shed and carried broadcast by the wind, lodge in the pores of the skin and cause severe eruption or rash to break out, with almost intolerable itching and sometimes dangerous irritation to the throat, nose and eyes.

Remedy. The following lotions will prove effective in allaying the irritation and itching:

Carbolic Acid, 5% sol.	$\frac{1}{2}$ teaspoonful, or $\frac{1}{2}$ drachm
Glycerine	2 teaspoonfuls, or 2 drachms
Oxide of Zinc	4 teaspoonfuls, or 4 drachms
Limewater	$\frac{1}{2}$ pint

External use, apply to skin for itching.

Chloral Hydrate	$\frac{1}{2}$ drachm
Carbolic Acid, 5% sol.	$\frac{1}{2}$ drachm
Camphor Water	2 ounces
Lime Water	4 ounces

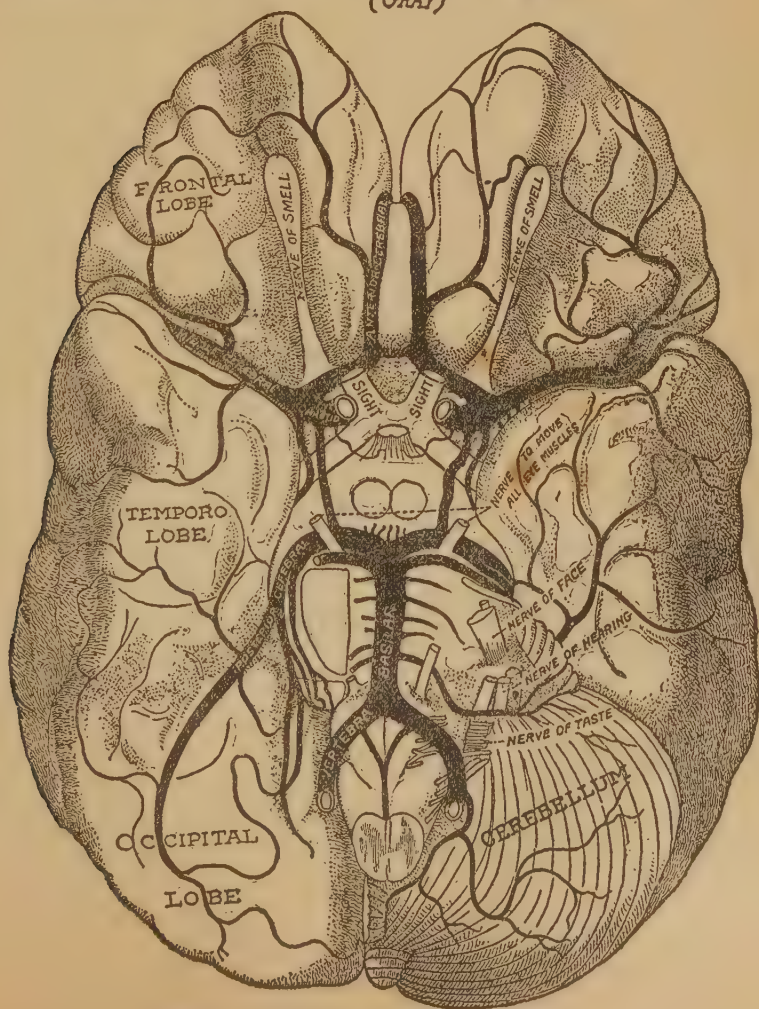
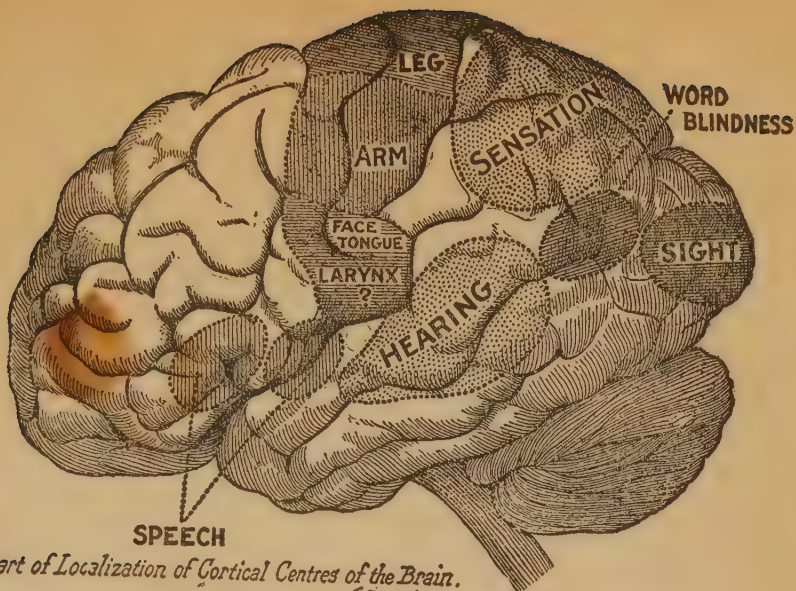
External use. Apply to skin.

Strong saleratus water will also give relief.

Red Nose.

SATURATE a piece of absorbent cotton with this lotion, and bind on at night until the redness disappears. Going out in the air apply cleansing cream and some powder. This forms a good protection.

Muriate of ammonia	1 dram	Glycerin	2 ounces
Tannic acid	$\frac{1}{2}$ dram	Rose water	3 ounces



DISEASES OF THE BRAIN AND NERVES.

(Also see Anatomy of Brain and Nerves.)

THE brain and spinal column are the great centres of the nervous system.

The brain produces *sensation, thought, and voluntary motion*. When this organ is diseased, therefore, we may expect one of these functions to be either disturbed or destroyed.

Of Sensation there are various disturbances, perversions, and suspensions, caused by disease of the brain and nerves; such as nausea, giddiness, specks floating before the eyes, ringing in the ears, deceptive tastes and smells, intolerable itching, neuralgic pains, boisterously high spirits, depression without apparent cause, anxiety, and dread.

Thought, in like manner, is disturbed and perverted in many ways. There is high delirium, dullness and confusion, loss of memory, weakened judgment, and every degree of stupor, down to entire loss of consciousness.

Voluntary Motion is perverted and destroyed in muscular twitchings, trembling of the limbs, spasmodic stiffness, involuntary jerkings, convulsions, muscular debility, and palsy.

The brain is composed of three parts,—the *cerebrum*, the *cerebellum*, and the *medulla oblongata*. These are all contained within the skull bones, and are immediately covered by three membranes, called the *dura mater*, the *arachnoid*, and the *pia mater*. The *dura mater* is a strong, *fibrous* membrane lying next to the skull-bones. The *arachnoid* is a *serous* membrane, lying next below, and the *pia mater*, which means pious mother, is a *vascular* membrane, lying next to the brain, dipping into it in places, and containing the vessels which bring to it all its nutrient materials. Hence its name.

These membranes are all liable to be inflamed,—and so is the brain.

Inflammation of the Dura Mater.

THE inflammation of this membrane does not often occur spontaneously; but it happens frequently from external injuries, as blows upon the head.

After a blow upon the head which stuns him, a man may recover himself, and for some days remain in perfect health. Then he has



pain in the head, is restless, cannot sleep, has a flushed face, red eyes, hot skin, hard pulse, rigor, nausea, vomiting, — ending with convulsions and delirium.

This disease is often caused by what is called *otitis*, or inflammation of the internal ear. In such cases, inflammation will arise within the tympanum, causing intense earache; matter comes at length from the external ear, but the pain does not stop; the patient shivers, becomes drowsy, perhaps delirious, and finally sinks into stupor. The dura mater is inflamed.

Treatment.—Inflammation of the dura mater, when caused by fracture, penetrating wounds, et cetera, of the skull, calls for surgical treatment.

Inflammation of the Arachnoid and Pia Mater.

Arachnitis.

THESE two membranes are generally inflamed together. They are so intimately connected that each involves the other in its own troubles.

Generally this is divided into three stages:—

The Irritative, characterized by wakefulness, irritable temper, repugnance to strong light, and contraction of the pupils.

The Inflammatory Stage, known by transient pains in the head, alternating with similar ones in the bowels, increased restlessness and irritability, a quick and tense pulse, an expression of discontent on the face, the eye-brows knit and frowning, the eye-lids half closed, retching and vomiting, deep sighing, and torpid bowels.

The Depressing Stage, in which the delirium is more continuous, the countenance has a look of surprise and stupor, the pupils are contracted or dilated, the white of the eyes injected and red, the pupils rolled up during sleep, constant sleepiness, inattention to surrounding objects, torpidity of mind, gradually increasing until complete coma closes all the senses.

The disease does not always exhibit all these symptoms, or come on in the regular way described. Sometimes the first thing noticed is a long-continued paroxysm of general convulsions. Again these convulsions will come on after violent pains in the head, and are attended with screaming.

Inflammation of the Brain. Brain Fever.

Encephalitis. — Phrenitis.

ACUTE and general inflammation of the brain and its membranes has two stages.

The Stage of Excitement, in which there is intense and deep-seated pain in the head, extending over a large part of it, a feeling of tight-

ness across the forehead, throbbing of the temporal arteries, a flushed face, injected eyes, looking wild and brilliant, contraction of the pupils, great shrinking from light and violent sound, delirium, want of sleep, general convulsions, a parched and dry skin, a quick and hard pulse, a white tongue, thirst, nausea and vomiting, and constipation of the bowels.

The Stage of Collapse, in which there are indistinct mutterings, dull and perverted hearing and vision, double vision, the pupil from being contracted expands largely and becomes motionless, twitchings of the muscles, tremors and palsy of some of the limbs, a ghastly and cadaverous countenance, cold sweats, profound coma, and death.

The disease will not show all these symptoms in any one case. It runs a rapid course, causing death, sometimes, in twelve or twenty-four hours; or it may run two or three weeks.

Treatment. — This should be energetic, and administered *early*. The measures usually employed are *hot foot-baths*, and the *application of cold to the head*, with occasional mustard poultice to legs.

Cold Applications. — These, applied to the head, are of great importance. First, shave the head, and put on cloths wetted in water as cold as it can be made, changing them often; or, put powdered ice in a flexible ice-bag, and lay it upon the head, — taking care not to make it too heavy. Heat in a few cases is better borne.

Cathartics. — These, while the inflammation is in the active stage, should be thorough and energetic. To effect it, many use calomel and other forms of mercury. They are not needed. Croton oil is one of the best articles (31), or colocynth, gamboge, etc. (32), without the oil, or the compound powder of jalap.

In the stage of collapse, if there is pallor of the countenance, a feeble and flying pulse, great debility and tremors, coldness of the extremities, etc., give wine and other stimulants.

See that the bladder is emptied every day.

The feet, in the early stage of the complaint, should be bathed in warm water, or mustard and water (242). Mustard draughts must also be put upon the feet.

The tincture of veratrum, given in full doses, to bring down the pulse, and produce sweating, must not be omitted. Give (351).

Softening of the Brain. — *Ramollissement*.

INFLAMMATION of the brain, when it has run its course, sometimes leaves this organ, or portions of it, in a softened condition. The

same mischief may happen to the brain from the blood-vessels which run to it being diseased, so as not to be able to carry blood for its proper nourishment.

Symptoms.—The most remarkable symptom of this disease is the rigid contraction of the muscles which draw up the limbs; the hand may be clenched and pressed against the shoulder, or the heel carried up to the hip.

The early symptoms are tingling, numbness in the ends of the fingers, perverted vision and sometimes blindness. The person usually tidy in habits and dress now becomes careless and slovenly. He occasionally complains of sleeplessness and the temper becomes irritable and friends notice that he takes offense when usually he would not notice. His forgetfulness is very noticeable at times to the extent of forgetting his name and that of his family, later on the symptoms are similar to those which will be described under the heading "Dementia."

Suppuration and Abscess of the Brain.

WHEN a diseased brain is examined after death, sometimes matter is found mixed in with the softened portion. This shows that suppuration took place. At other times, the matter is found in a cavity, which shows that an abscess had formed during life.

The symptoms of these mischiefs are convulsions in the earlier stages, and palsy in the latter. Surgical methods now often save life, and cause a cure in these cases.

Induration of the Brain.

INSTEAD of softening the brain, inflammation sometimes does the very opposite, — it hardens it, — producing a change something like that which happens to white of egg when dipped in hot water.

Convulsions appear as the result of this change, as in suppuration and abscess; palsy much more seldom.

Tumors of the Brain.

TUMORS infect the brain occasionally, — growing around it, on all sides, pressing themselves into its substance, and causing many disturbances. Cancers and hydatids are found there. The signs which these irritating bodies produce are like those of other diseases of the brain, and therefore cannot be distinguished during life. Syphilis is often the cause of them, and, when due to this, may be cured.

Delirium Tremens.—Drunkard's Delirium.

Mania a Potu.

THIS is often mistaken for brain-fever; but it is quite a different

disease. It is not the result of *inflammation* of the brain, but of *irritation*. It is important to distinguish it from inflammation, because the remedies which are employed for that would be injurious if used for this.

The Symptoms are incessant talking, fidgeting with the hands, trembling of the limbs, a rapid pulse, profuse sweating, utter sleeplessness, and a mingling of the real with the imaginary in the busy talk. The patient is apt to think some one is about to do him a great injury, yet is unwilling to be alone. His face is pale and sallow (sometimes red and flushed), his eye is rolling, quick and expressive, his speech stuttering and inarticulate,—bodily and mentally, he is *busy* day and night, and can with difficulty be confined to his bed or room. As the disease advances, and he has been long without sleep, he imagines vermin to be crawling upon his scalp and body; troops of rats run across his bed, or look at him out of the wall; giant boxers confront him, and he squares off for a round at fisticuffs; animals, figures of all shapes, and horrible monsters frighten his imagination; devils laugh at him, and dance before him. In long and sleepless hours, he talks and chatters with these spectral phantoms,—now beckoning them, now shrinking from them, till he wears out and sinks from exhaustion. This is a disease of drunkards and opium eaters. The attack generally occurs in consequence of the withdrawal for three or four days of the accustomed stimulus.

If the delirium is the result of recent heavy drinking, an emetic should be administered to empty the stomach of what is remaining there. Sulphate of zinc, 20 grains well diluted with water, or ipecac, 30 grains may be given, after which a good cathartic such as 30 grains of compound jalap powder for unloading the bowels may be used. If the patient is depressed and nervous, spirits of aromatic ammonia may be used. In more marked cases, strong black coffee by the mouth or rectum; even strychnine in 1-30 grain doses will be needed for the heart. Bromide of soda, 30 grains dissolved in one-third glass of water may be given every two hours to keep the patient quiet. Morphia and the other preparation of opium, while very valuable, should be used with great care; 20 drops of laudanum every two hours for two or three doses will usually, in conjunction with the bromide, quiet the patient, but the exclusive administration of opium or giving it in large amounts should be under the control of a physician. Bathing the patient in the tepid bath, during which cold applications are kept on the head, may be used for hours at a time if the patient does not rebel at this treatment, but usually the quieter he can be kept the sooner he will recover.

Inebriety.—Drunkenness.

IN the beginning of the present century insanity was regarded as a visitation of God's displeasure and not as a disease subject to scientific investigation and amenable to treatment. Inebriety is regarded now

as insanity was some hundred years ago, the disease being considered irremediable. Alcohol is a poison, and like other poisons is capable of destroying life. In large doses it becomes a powerful irritant or a narcotic producing coma and death. It being constantly introduced into the system produces a general disease in the system. We believe inebriety can be cured like any other disease, but is subject to relapses like other diseases.

The "alcohol habit," under the title Inebriety, oftentimes has the symptom or outward manifestation of diseased conditions, which antedate the alcoholic craving, and are its predisposing and exciting causes which retard, and sometimes even prevent a cure.

In the popular, and too often in the professional mind, alcohol is regarded as the cause and root of the whole evil of inebriety. We desire to assert that inebriety is frequently dependent upon causes with which alcohol has nothing to do. There is a neurotic craving—it may be congenital, it may be developed as the result of disease or accident. This craving demands the various forms of narcotic stimulants, those that first excite, then produce narcosis more or less complete. Alcohol fulfills this condition, is easily accessible, reasonably inexpensive, and is the one drug that meets a morbid craving that seems to be almost universal.

We do not fail to recognize the deteriorating effects of alcohol manifested principally, at least, more pronouncedly upon the nervous system as seen in the various forms of insanity. We also note the degenerating effects of alcohol on lung, liver, kidney or other organs and tissues of the body; or as a special poison in the same sense that lead, arsenic and tobacco produce their effects.

We believe that the great majority of inebriates become so from heredity, environment and disease, that produces physical degeneracy and pushes them over and plunges them into inebriety.

The patient with fever craves and may drink water freely, excessively and injuriously. The diabetic is an aqua-maniac in a certain sense, but in neither case do we recognize the aqua-mania or water craving as the disease, but rather as proceeding from certain abnormal conditions which we readily recognize. So the liquor thirst is the result of morbid conditions that produce an abnormal desire, which alcohol seems, temporarily at least, to satisfy.

The excessive use of alcohol, while it is oftentimes the cause of various diseases of the nervous system, and also a frequent cause of insanity, is also the precursor or initiatory symptom of certain diseases of the nervous system and also of insanity.

The paretic will crave and use alcohol in the earlier stages of his malady. The victim of nervous syphilis is addicted to it, more especially in the later stages, when the nervous system becomes involved.

Any depressing, exhausting, or painful disease may produce the alcoholic craving, alcohol being sought for its stimulating properties.

Alcohol, moreover, is second only to opium, ether, or chloroform as an anæsthetic; indeed, has been used as a substitute for the latter. Hence, persons find experimentally that alcohol relieves pain, and its use is carried to a harmful extent, its deleterious effects produced, and inebriety established.

It is possible that a healthy individual, with good personal and family history, may use alcohol sociably or as a matter of custom, until the habit becomes firmly established.

The alcohol breaks down the constitution, invades and degenerates the nervous system, and thus develops inebriety, because the alcoholic degenerations, or even functional disturbances of the nervous system, are the very conditions under which inebriety is established. We say this is possible, but we assert again that behind the large majority of inebriates will be found a defective family or personal history, not only complicating but causing the inebriety; retarding, oftentimes preventing a cure.

It can be thus seen that inebriety is but a symptom — a flag of distress hung out by the nervous system. As some one has aptly said, “neuralgia is the cry of a diseased nerve,” so the “drink-craze” is the cry of the neurasthenic for a stimulant, of the pain-tortured nerve for an anæsthetic, of the victim of insomnia for a hypnotic.

Not any patient that applies for relief to the physician needs a more careful examination than does the inebriate. You may rest assured that there is some underlying cause, probably several that must be removed if we would restore the inebriate to his former habits of sobriety. If he is found suffering from the later manifestations of syphilis he will need special treatment for this condition, especially if the nervous system is involved; a painful stricture of the urethra may require division.

Chronic malarial poisoning with its complicating disorder of stomach, liver and spleen, will demand special treatment. In a case on record the irritation of a tape-worm produced a tendency to the excessive use of alcohol, which tendency passed away when the worm was expelled.

In a word, a large majority of inebriates are diseased persons, and that primarily and antecedent to their inebriety, which is appended to and aggravates their diseased condition.

Special diseases, therefore, require special treatment, irrespective of the inebriety, if we would cure the inebriate. In this connection we may ask, are there any drugs that we can substitute for alcohol that will take its place, and satisfy the inebriate, as a substitute for alcohol?

Opium and the salts of morphia will do so in a marked degree, although cocaine, chloral and the bromides have been so used.

The use of opium or morphia is not uncommon among inebriates who desire to “leave off alcohol.” The inebriate, as a rule, is a congenital neurotic. From birth almost, he reaches out for some drug that will gratify or meet his neurotic craving. The alcohol and the

ACTUAL EFFECTS OF ALCOHOLIC LIQUORS ON THE HUMAN STOMACH AND KIDNEYS

THE KIDNEYS



HEALTHY CONDITION



DISEASED FROM INTEMPERANCE

THE STOMACH



HEALTHY CONDITION



DISEASED FROM INTEMPERANCE

opium habit to the inebriate are convertible habits, and the inebriate, like a pendulum, will swing from alcohol to opium; not infrequently the two habits are combined, as in the form of *tinct. opii*, constituting a mixed habit, in which the effects of both alcohol and opium have to be considered. Occasionally a case is presented in which morphia is used hypodermically, and the alcohol used in the usual manner. In cases where opium addiction is associated with the habitual use of alcohol, the opium habit is of paramount importance and the alcohol assumes a secondary place.

The fact that opium can substitute alcohol is the keynote to many vaunted secret cures, in the so-called "narcotic treatment" for alcohol. It simply substitutes one habit for another, and as long as the victim is taking the so-called remedy he is reasonably comfortable. But I admit if the "narcotic treatment" was carefully practiced, in judicious hands it might, in conjunction with such other remedial measures as would best eradicate the primal causes of the inebriety, prove useful, if not curative, in cases of inebriety.

Are there any drugs that are specifically beneficial for the treatment of inebriety as such? We would state that drugs that act directly as a stimulant to the nervous system are of value. Strychnia is a type of this class of drugs, and one of the best of its class.

Luton, of Rheims, Belgium, was the first to point out its value in alcoholism. Then the Russians used it largely and it was known as the "Russian treatment," and finally, the Americans adopted its use in such cases.

Strychnia has proved serviceable as both abortive and curative in acute alcoholic delirium, as well as useful in the more chronic forms of alcoholism. It seems to be tolerated in such cases — in cases of alcoholic poisoning under normal conditions, we have no record of the value of strychnia as an antidote; interesting experiments might be made on the lower animals with the view of determining this point. Strychnia is an excellent cardiac tonic, and one of the best respiratory stimulants, and might be used in general medicine in cases in which alcohol is oftentimes prescribed.

Oxide of zinc, during the past twenty years, has been used with advantage in cases of chronic alcoholic intoxication.

Quinine has been used more particularly in the later or convalescent period of the treatment of alcoholism.

The so-called "Red Cinchona Cure" for a time interested the public. Rational medicine does not recognize any special drug or specific remedy as a universal cure for inebriety, nor does clinical experience form any basis for such a claim. From the very nature of the case, such a remedy would be impossible. The ætiology of inebriety is dependent on such a variety of causes and its environments and complications so numerous that any one remedy could not fulfill all, or even meet the more important of these conditions. However valuable drugs may be to meet certain indications in the various conditions incident to inebriety, we believe that so far as the curative

treatment of inebriety is concerned, drugs must assume a secondary place, valuable as they may be in their respective spheres.

In the treatment of the alcohol habit we place first: *Restraint and seclusion in a special asylum for a definite period, and total abstinence during this period.*

In a few words, concisely expressed, this statement includes the plan now adopted by the leading asylums of this country and of Europe for the recovery of the inebriate. It involves restraint, (legal, if need be), seclusion, a special institution, in which all the latest and best methods of dealing with the inebriate are procurable, a sufficient period in which to apply these measures, and we need hardly add, a long period of total abstinence from all alcoholic liquors. We need hardly add that diet, rest, recreation, hygienic surroundings, and the exhibition of appropriate drugs are all included in the above plan.

The causes of degeneration being removed, the factors of regeneration being brought into action, new formation of nerve, muscle and tissue must supplant degenerated tissue, if haply organic disease has not resulted in irreparable injury.

We have hinted at an hysterical element in the history of inebriety. The inebriate, whatever may be his condition, is largely influenced by his surroundings.

In the light of such an hysterical element in the clinical history of inebriety, we can readily account for the apparent success of the so-called temperance movements that sweep over communities periodically and effect many apparent cures, or rather, in the language of the day, reformations. Such an element will also explain why, after such a tidal wave of excitement, relapses take place oftentimes in large numbers, and the period of excitement is followed by a period of reaction.

The occurrence of relapses is readily accounted for by the fact that the stimulus of the period of excitement buoys up the inebriate for the time being, during which strong mental emotion is a powerful factor. He is keyed up, as it were, for the time, and sustained by a moral stimulus. When this is withdrawn, reaction, followed by corresponding depression, sets in, and the old method of stimulation is again imperatively demanded and yielded to.

Why some inebriates go through such a period of excitement and do not relapse, and why others do, can be accounted for by the fact that the former are in a reasonable degree of physical health, and are not burdened, dragged down and handicapped, either by disease that is non-alcoholic, or that is the result of alcoholic degeneration. The inebriates so affected are not influenced, or if at all, only temporarily, by the so-called "temperance revivals" that appear and disappear with almost stated regularity in large and small communities, and we must add do good, but only in the channel indicated.

It is also operating through this hysterical feature of inebriety

that charlatanism may effect a temporary, possibly a permanent success in a certain class of cases.

In cases where the hysterical element largely preponderates, we believe psycho-therapeutical agencies, or even those that appeal to purely mental conditions, will be of service, but they will not cure a cirrhotic liver, lung, or kidney, or remove the physical causes upon which the inebriety may depend. In addition to those measures that appeal to the higher moral nature, there ought also to be combined such as meet certain intelligent wants. To this end all reasonable amusements, entertainments, and especially such occupations as will interest the person and keep him busy, should be encouraged, if not made compulsory.

Incidentally I may mention hypnotism as having been used especially by French physicians, with some benefit in cases of chronic alcoholism. I have no data to give, and have not had any personal experience with it.

The Bi-Chloride of Gold cure, known as the Keeley cure, is in many cases successful, but not in all. Would advise its use as a last resort; though we think its use sometimes leads to insanity and suicide. It cures at all events for the time being.

If the temperance advocates would supply light, warm, cheerful places of resort with hot and temperance drinks, supplied with pool and billiard tables where the poor could spend their evenings and meet each other and amuse themselves at a reasonable expense, and establish cooking schools for the wives where they could learn how to cook nourishing and palatable food which would supply the body with the nourishment which it must have and requires, we believe it would do more towards temperance than all the laws that could be passed.

Many prominent physicians who have made alcoholism a specialty, strongly recommend the immediate withdrawal of all liquors, and isolation from all company where habits and influence would lead to temptation, taking the following prescription faithfully for three or four months:

Sulphate of magnesia	.	.	.	.	.	one teaspoonful.
Nitric acid	.	.	.	.	.	" "
Sulphate of iron	.	.	.	.	.	" "
Powdered cinnamon	.	.	.	.	.	" "
Sugar of milk	.	.	.	.	.	three teaspoonfuls.
Distilled water	enough to fill a six ounce bottle.					

One teaspoonful frequently when the crave is on, and in a wine-glassful of water.

Cold sponge bath also should be taken once or twice a day.

Enlargement of the Brain. — *Hypertrophy.*

THIS is chiefly a disease of childhood. It consists in an unnatural growth of the brain. Sometimes the skull grows with it, and there may not be any, or only slight, symptoms of disease.

The complaint is sometimes congenital, — the child being born with a head far above the natural standard of size. Sometimes a child's head, from this disease, will reach the size of an adult's by the time it is five or six years old. This is not necessarily a *disease*, though children that suffer from it are very apt to die finally of some affection of the brain.

Symptoms.— Dullness of intellect, indifference to external objects great irritability of temper, inordinate appetite, giddiness, and an habitual headache, which at times is very severe. In addition to these, there are, at times, convulsions, epileptic fits, and idiocy. There is a peculiar projection of the parietal bones, which serves well to distinguish this disease from acute hydrocephalus.

Treatment.— As far as possible, suspend and repress all exercise of the mind. Take the child from school as soon as the disease is discovered, and put it to the most active muscular exercise in the open air. The moment there is any excitement of the brain, or heat on the top of the head, apply cold water, ice, or cold evaporating lotions. If, as the child grows up, the signs of mischief increase, the diet must be simple, and carefully regulated. Bread and milk only is sometimes advisable.

Shrinking of the Brain. — *Atrophy.*

THIS is a disease in which the volume of the brain is diminished. There are two forms of it; one is congenital, the brain not being properly developed at birth; the other occurs in consequence of disease either in the membranes or the arteries. The symptoms are not distinguishable during life from those of other brain affections, and therefore it can only be treated according to general principles.

Water in the Head. — *Acute Hydrocephalus.*

THIS, like enlargement of the brain, is likewise a disease of childhood, and often attacks *scrofulous* children.

Being an inflammatory disease, it is important to have early notice of its existence, and, if possible, to be aware of its *approach*; which we may be, frequently, by observing the following *premonitory*

Symptoms; namely, a disturbance of the digestive functions, indicated by a capricious appetite, — the food at one time being disliked, at another devoured greedily; a foul tongue, offensive breath, enlarged and sometimes tender belly, torpid bowels, stools light-colored from having no bile, or dark from vitiated bile, fetid, sour-smelling, slimy and lumpy. The child loses its healthy look, and grows paler and thinner. Its customary spirit and activity are gone; it is heavy, languid, dejected; it is fretful, irritable, uneasy; and sometimes is a little tottering in its gait.

After these warning symptoms, the disease may begin in one of three ways: —

The pains in the head become more severe and frequent, and are sharp and shooting, causing the little patient to wake and shriek out. As the drowsy state advances, the shrieking gives place to moaning. Beside these symptoms, there are stiffness in the back of the neck, pain in the limbs, great tenderness of the scalp, vomiting, sighing, intolerance of light, knitting of the brows, increased disturbance of stomach and bowels. This stage may last ten to fourteen days, the child growing more weak and peevish.

Another form of attack is marked by acute pain in the head and high fever, convulsions, flushed face, brilliant eyes, intolerance of light and sound, pain and tenderness in the belly, stupor, great irritability of stomach, causing retching and vomiting upon every attempt to sit up in bed.

The third mode of attack is very insidious, — the early symptoms being mild and hardly noticeable, or not even occurring at all. In such case, the convulsions or palsy come suddenly, without notice, bringing swift and unexpected destruction. This has sometimes been called *water-stroke*.

The First Stage is the period of *increased* sensibility and excitement, caused by inflammation, in which the pulse is quick and irregular.

The Second Stage is one of *diminished* sensibility, or lethargy, during which water is effused upon the brain, and the pulse is slow.

The Third Period is one of palsy and convulsions, with squinting of the eyes, rolling of the head, stupor, and a rapid, thread-like pulse.

Treatment. — The first or inflammatory stage of the fever is very important, and must be controlled for five or six days. Scammony and croton oil (33) may be chosen for this purpose. Apply cold water, ice, etc., to the head. Use tinct. veratrum viride or (355).

In the second stage, put poultices upon the back of the neck, and one upon the bowels if they are very tender.

In the third stage, effusion having taken place, use the warm bath, or the vapor bath, — also digitalis, squills, and iodide of potassium, (144), (128), (302), (130). The effusion, if permanent, may be drawn off.

Confine the child to a darkened room, of moderate temperature, — excluding all noise and causes of excitement, and let him lie upon a hair mattress, with his head somewhat elevated.

Diet. — Gruel only during the stage of excitement, — during that of collapse, it should be nourishing, but mild and easy of digestion, as beef tea, plain chicken or mutton broth, and animal jellies. At the same time, support the patient by the cautious use of the aromatic spirit of ammonia, ten drops every four hours, valerian, wine whey, and infusion of gentian, columbo, or quassia, (64), (66).

Dropsy of the Brain.—*Chronic Hydrocephalus.*

Acute hydrocephalus is an *inflammation*; *chronic* hydrocephalus, now to be considered, is a *dropsy*. It often begins before birth. It consists in the accumulation of enormous quantities of water within the brain, sometimes within its ventricles, at other times upon its surface. When it occurs soon after birth, it advances slowly and imperceptibly, — the enlargement of the head being the first thing noticed.

The skull being tender in infancy, it separates at the fontanelles, as the fluid accumulates, and the head, at times, attains an enormous size, — so great that the child cannot carry it upright, but lets it droop laterally upon the shoulder, or forward upon the breast.

As the disease advances, the senses become blunted, the child is deaf or blind, the intellect is weakened, perhaps idiocy appears, the flesh and strength pass away, convulsions and paralysis come in their turn, and a stupor is apt to occur which ends in death.

Treatment. — The remedies may be external, or internal, or both.

Internal Remedies. — These should be purgatives (33), (31), or diuretics and alteratives (302), (145), (144).

External Remedies. — Apply an ointment of the iodide of potassium to the scalp every night (185). A tight bandage applied over the whole head will sometimes have a favorable effect. Another expedient is to puncture the skull and draw off the water. Tapping the brain has effected a cure in many cases, and perhaps promises the most relief of any remedy we have. In newly-born children with this affection, it is the best means.

As may be expected, none of these remedies are likely to give the benefit desired, and an operative interference above proposed constitutes a risk which it is perhaps better to run even if it results in the death of the child, rather than have it become a hopeless invalid with epileptic convulsions and the other manifestations of an impaired brain.

Cerebro-Spinal Fever.

Definition.—This disease may be contracted by poisoned air and through the medium of fluids, and though markedly infectious, is not supposed to be contagious. The other names are spotted fever or cerebro-spinal meningitis. The disease is found among children and young adults more often than among the aged. It occurs suddenly in epidemics which cover a large territory and it does not appear to be referable to any known laws or atmospheric conditions. The death rate is exceeding high considering the number that have the disease, and this rate varies during different epidemics although there are different forms of severity.

Symptoms.—As a general rule the first symptoms are intense headache with pain in the back of the neck or through the extremities and chest, followed by a moderate fever without sweating. Vomiting, and delirium with convulsions are common symptoms. In a small portion of the cases, under fifty per cent, an eruption occurs, which gives the name of Spotted Fever to the disease. The bending back of the head on the neck making it impossible to bring the head forward is known as retraction of the head and is a very common symptom. Deafness, blindness and other complications are the result of irritation of the nervous system. The disease may be mistaken for typhoid fever early in its course, though the bowel symptoms in the latter disease are much more prominent.

Herpes or cold sores on the nose and lips are common in meningitis and very rare in typhoid.

Treatment.—Cold to the head by means of ice bag should be at once resorted to. The diet should be light and sedatives such as the bromide of soda or chloral in 20 grain doses by the mouth and even morphia in one-fourth grain doses will be needed to relieve and quiet the nervous irritation.

Diseases of the Spinal Cord.



FIG. 84.

THERE are few diseases more interesting, as a study, than those which affect the nervous cord which runs through the centre of the back-bone. This cord is a continuation, an appendage or tail of the brain. (See Figure 84.) It is the seat and centre of certain nervous functions, called *reflex*, by which so many movements take place which are not under the control of the will.

In order that we may feel what takes place in any part of the body or limbs, and that the will may have power to move such part, it is necessary that nervous matter should be continuous and unbroken between the part in question and the brain.

If the spinal cord be cut, broken, or crushed at any point, all those parts which receive nerves from *below* the injury, lose their power of motion and their feeling. When the injury is in the upper part of the cord, the breathing and the circulation will stop, and death is the immediate consequence. If the middle portion of the cord be the seat of the injury, the bowels and other organs may lose their motion and feeling; if the lower portion, then the lower limbs only will be the sufferers.

Disease or injury in the upper part of the cord is therefore much more dangerous than the same thing occurring in the lower.

Inflammation of the Spinal Cord.

THE membranes which surround the cord may be inflamed just as those are which enclose the brain; but as the cavity running through the spine is quite small, there cannot very well be inflammation of the membranes without its involving the cord at the same time.

Symptoms. — Pains, often intense, running along the spine, extending out into the limbs, and made worse by motion. They are similar, in some respects, to rheumatic pains. There is rigid contraction, and sometimes violent spasms of the muscles of the back and neck, — so great, at times, as to bend the body back into the shape of a hoop; also a feeling of constriction in various parts, as if they were girt by a tight string; a sense of suffocation; retention of urine; a most obstinate constipation and frequent chills or rigors. The pain which is felt along the cord is aggravated by rapping upon the spine, but not by pressure.

The above symptoms are supposed to be the result of inflammation predominating in the membranes. When its seat is more particularly in the substance of the cord, the symptoms are, — convulsive affections of the head and face, inarticulate speech, loss of voice, squinting, and difficulty of swallowing, if the extreme upper part of the cord is inflamed; if the disease be slightly lower, difficulty of breathing, irregular action of the heart, and tightness of the chest; if lower still, vomiting, pain in the belly, sensation of a cord tied round the abdomen, pain and heat in passing water, retention of the urine, inability to retain the urine, desire to go to stool, or involuntary stools.

Spasm and stiffness, then, are the results of inflammation of the membranes; convulsions and palsy, of the same affection of the cord.

Treatment. — When the inflammation is acute, apply counter-irritation along the sides of the spine. In chronic inflammation, powerful friction, mustard plasters, or stimulating liniments (190) will generally answer the purpose.

Apoplexy.

APOPLEXY is that condition in which all the functions of animal life are suddenly stopped, except the pulse and the breathing; — in which there is neither thought, nor feeling, nor voluntary motion; in which the person falls down suddenly, and lies as if in a deep sleep.

Modes of Attack. — There are at least three ways in which this terrible disease may make its assault.

The First form of attack is a sudden falling down into a state of insensibility and apparently profound sleep, — the face being generally flushed, the breathing stertorous or snoring, the pulse full and not frequent, with occasional convulsions.

From this mode of attack some die immediately, others get entirely well, and others get off with the exception of paralysis on one side, or the loss of speech, or some one of the senses.

The Second form of attack begins with sudden pain in the head. The patient becomes pale, faint, sick, and vomits, — has a cold skin and feeble pulse, and occasionally some convulsions. He may fall down, or may be only a little confused, but will soon recover from all the symptoms, except the headache, — this will continue, and the patient will sooner or later become heavy, forgetful, unable to connect ideas, and finally sink into insensibility, from which he never rises.

This mode of invasion, though not appearing so frightful as the first, is of much more serious import.

In the Third form of attack there is sudden loss of power on one side of the body, and also of speech, but not of consciousness. The patient retains his mind, and answers questions either by words or signs. This may be called paralytic apoplexy. The patient may either die soon, or get well, or live for years with imperfect speech, or a leg dragging after him, or an arm hanging useless at his side.

The Persons Attacked are apt to have large heads, red faces, short and thick necks, and a short, stout, square build, though it occurs often among those who are thin, pale, and tall. The tendency to it increases in advanced life.

The Forerunners of apoplexy are headache, vertigo, slight attacks of palsy, double vision or seeing two objects when there is but one, faltering speech, inability to remember certain words, sometimes a sudden forgetfulness of one's own name, a frequent losing of the thread of ideas attempted to be pursued, and occasionally an unaccountable dread, for which no reason can be given.

Exciting Causes.— Whatever hurries the circulation of the blood, as strong bodily exercise, is an exciting cause. So are all those things which cause the blood to flow towards the head, as coughing, sneezing, laughing and crying, straining at stool when costive, lifting heavy weights, singing, and playing on wind instruments. To these may be added, exposure to the sun, the bad air of crowded rooms, holding the head down, or turning it around to look backward, tight cravats worn about the neck, and exposure to severe cold.

Treatment.— If the patient have the appearance of suffering from fulness of blood in the head, as evinced by redness and turgescence of the face and throbbing of the temporal arteries, and if the pulse be full and hard, feeling like a tense vibrating rope under the finger, place him in a half-recumbent posture, with his head raised; loosen his clothes, particularly his neck-cloth and shirt collar, and whatever may press upon the neck, and then as quickly as possible apply cold wet cloths to his head, changing them often. Ice is still better, if it

may be had. Lay the patient sufficiently on his side so that the tongue and saliva will fall forward instead of back into the pharynx. Apply mustard and friction to the soles of the feet. If the pulse is feeble and the face pallid, or if the patient is aged, give stimulants and tincture digitalis (five drops every hour or two), put ice behind the ears, and give purgative injection (246). For the subsequent fever 4 drops of tincture of veratrum viride or tincture of aconite may be given 3 times daily; for the headache and delirium 5 grain doses of bromide of camphor every 2 or 3 hours is useful.

To promote absorption of the blood-clot the kidneys and bowels should be kept active, and a thorough course of iodide of potash in 5 or 10 grain doses three times daily should be given.

To prevent future attacks, gentle tonics should be used, and the skin should be kept healthy by daily bathing and friction. The bowels must not be permitted to become costive. The diet should be light, chiefly vegetable, and almost entirely so in hot weather. The food should be well chewed. The mind should be kept cheerful and hopeful, and free from great excitement. The sexual passion should be restrained, and very rarely indulged. Intoxicating drinks should be abandoned, if used, and all tight cravats be discarded from the neck. Direct rays of the hot sun in summer should be carefully shunned. No food should be taken for three hours before retiring, and a mattress only, of some degree of hardness, should be slept upon,—the head being always well elevated. To these precautions, I would add dipping the feet every night before retiring in hot water; and, if any tendency to cold feet be experienced, dusting pulverized cayenne in the bottoms of the stockings.

Sunstroke.—*Coup de Soleil.*

Sunstroke results from the exposure of the body to excessive heat in the form of high temperature either of the sun's heat, from a furnace, or an exceedingly hot day from heat without direct exposure from the sun. There are two varieties, one known as heat exhaustion, where the temperature of the person's body is only slightly elevated, if at all, the other, and the more common one "heat stroke" or "sun stroke" in which the temperature of the body is raised many degrees. The symptoms are headache, dizziness and sometimes difficult breathing and thirst in the earlier stages, which if not recognized and means taken to prevent more serious troubles, at once go into unconsciousness, possibly accompanied by convulsions and spasms. If the fever cannot be reduced a serious condition occurs, followed probably by death inside of twenty-four hours. Even an improve-

ment may be followed later by a fatal meningitis. Persons who have once had sunstroke are also greatly afflicted by high temperatures which is intensified if the air is moist. It is needless to add a large portion of these cases die.

Treatment.—As is known the normal temperature is $98\frac{1}{2}$ degrees and the bath is used to reduce the temperature as near this as possible. Strip the patient, lay him flat on the floor or low bed and if possible apply ice; ice water or even a stream of cold water from a hose may be applied over the body, but the circulation must be kept up by an attendant rubbing the surface of the body to produce reaction so that the cooling of the body will be general and not entirely on the surface, as the congestion of the body with heated blood which would be caused if the rubbing was omitted would kill the patient. Ice should be applied to the head by means of an ice bag or some other means. Constant care should be taken that these measures while strenuous, should not be carried too far when the temperature once begins to drop, as when once started the patient immediately goes into collapse from the fever dropping too rapidly. Heart stimulants such as teaspoonful of aromatic spirits of ammonia with twenty drops of compound spirits of ether or strychnia in one-thirtieth grain doses may be given to support the heart. Alcohol should be avoided as it will only increase the congestion in the head; some good cathartic, as citrate of magnesia, should be given and the headache which often follows may be relieved by a twenty-grain dose of bromide with five grains of phenacetine added; the recurrence of high temperature should be watched for as it very often occurs, when cold baths will be again required, as a relapse is not at all uncommon.

Palsy. — Paralysis.

PALSY is a loss of the power of voluntary motion and feeling, one or both coming on, sometimes gradually, but more often suddenly, and extending at one time to a part, at another time to the whole body. It is a kind of station-house on the way to apoplexy, where passengers stop, not merely to stay over night, but to rest many days, or even years.

A great injury inflicted upon the brain, either by pressure or other cause, will induce a complete loss of motion and feeling, and this extending to the whole structure, brings likewise a loss of consciousness, which is apoplexy. A smaller degree of pressure, or a less injury upon the same brain, would occasion a loss of motion only, or, if a loss of feeling were experienced also, it would only extend to a part of the body, and consciousness would remain. This would be palsy. The disease is like apoplexy in kind, but stops short of it in degree.

Paralysis of One Side of the Body.—*Hemiplegia*.

WHEN palsy affects an entire half of the body, dividing it through the centre of the face, neck, body, etc., from head to foot, it is called *hemiplegia*. It is more nearly allied to apoplexy than any other form of the disease, and is generally ushered in by pretty well-marked apoplectic symptoms.

Symptoms.— Sometimes there are no premonitory symptoms ; but often before the attack there are flushed face, swelling of the veins about the head and neck, vertigo, a sense of fullness, weight, and sometimes pain in the head, ringing in the ears, drowsiness, indistinct articulation of words, or even loss of speech, confusion of mind, loss of memory, and change of disposition, — amiable persons being made sullen and peevish, and irritable ones mild and simpering. After the attack, the countenance generally acquires a vague expression ; the mouth is drawn to one side ; the lower lip on the palsied side hangs down, and the spittle dribbles away. The speech is altered, and the mind is generally impaired.

In some instances, the patient recovers in a longer or shorter time ; in others, little or no improvement takes place, and the patient, after remaining helpless, often for a long time, dies either from gradual exhaustion, or suddenly from apoplexy.

Causes.— Hemiplegia and paraplegia are caused by pressure upon the brain, by the effusion upon it of blood or water, by a tumor, by mechanical injuries, by the striking in of eruptions, and by intemperance in eating and drinking. Paraplegia often results from disease or injury of the spinal marrow.

Treatment.— In so many cases does the administration of iodide of potash give greater or less relief to different diseases of the brain resulting in paralysis that its use is recommended. It must be persisted in for weeks and months. The doses need not be excessive, and five to ten grains in a half glass of water or milk a day and continued some time will often be followed by improvement. There are other preparations of similar nature recommended from time to time but all depend upon the amount of iodine which can be absorbed by the system.

Paralysis of Lower Part of Body.—*Paraplegia*.

THIS form of palsy divides the body *transversely*, at the hips, and confines itself to the lower extremities, and to the parts about the pelvis.

Symptoms.— When it arises from affections of the brain, it is attended by pain in the head, giddiness, drowsiness, dimness of sight,

and impaired memory. Numbness is sometimes felt in the upper extremities as a forerunner of this form of palsy. At first there is a slight stiffness and awkwardness of the motion of the legs, which continue to increase till a cane is needed to balance the body and make it steady. From a paralysis of the neck of the bladder, the stream of urine grows more feeble, and finally dribbles away involuntarily. The bowels are for a time costive, but when the circular muscle which closes the fundament becomes palsied, the feces pass without consent of the will.

When disease of the spinal cord is the cause of the complaint, it is apt to come on gradually; languor and weakness are felt in the knees, the legs are not easily directed in walking, — being thrown across each other, causing tripping and stumbling. By degrees the loss of power increases in the thighs and legs, until at length the whole lower extremities become palsied and useless.

Local Palsy.

PALSY is called *local* when it is confined to a single limb, or muscle, or locality. One of these forms is called *facial* palsy. It affects one half the face only, and is a good specimen of these affections. It removes all power of expression from one half of the face, and leaves the features still, blank, and unmeaning. With the affected side of the face, the patient cannot laugh, or weep, or frown, or express any feeling or emotion, while the features of the other side are in full play. Among the ignorant, who do not comprehend the extent of the evil, the drollness of the expression excites laughter.

Shaking Palsy.

THE nature of this form of palsy is well expressed by its name.

Symptoms.— The first symptom of this complaint is a weakness and tremor of the head or hand. In about a year the other hand, or the lower extremities become affected; and the patient begins to lose his balance in walking. Then the trembling becomes perpetual; no limb or part remains still. Reading and writing are no longer possible, and the hand cannot even carry the food to the mouth. The balance cannot be maintained in walking; there is a tendency to fall forwards, and to avoid it, the patient is obliged to run or move quicker, and upon the toes.

At a later period, the tremor continues during sleep; there is increased weakness; the body is bent forward, the speech becomes indistinct, swallowing difficult, and the bowels torpid. At last the urine and feces pass involuntarily, and delirium and coma bring life to a close.

Lead Palsy.

IN this disease the muscles of the forearm are palsied, so that the wrists "drop," as it is said, and the hands hang down when the arms are stretched out. It is caused by the gradual introduction of lead into the system. It is a disease, therefore, peculiar to painters,—particularly those who use carbonate of lead, or white lead, as it is called. It is generally the sequel of painter's colic.

Treatment.—A sudden and severe attack of palsy requires the same treatment as apoplexy. When the bowels are obstinately constipated, they must be moved by scammony and croton oil (31), (32) and by injections (246).

When all the symptoms of determination of blood to the head have disappeared, and the disease has become strictly chronic, exciting remedies must be employed, as frictions, stimulating liniments, blisters, stimulating baths, cold affusion, and electricity. Among the internal remedies, strychnine has the best reputation (85), (86). The tincture of the poison oak is well recommended (284). An alterative (145) should likewise be used.

Apply counter-irritants along the track of the spine, such as blisters, the moxa, the compound tar-plaster, and the pitch-plaster.

At first the diet should be light; but after the more active symptoms have disappeared, it should be nutritious, and sometimes stimulating. Flannel underclothes should always be worn next the skin.

For lead palsy, the best remedy is iodide of potassium, three to ten grains, three times a day, dissolved in water, one ounce of the salt to six ounces of water, and taken in simple syrup. The affected limb should also be soaked an hour each day in a gallon of water, with half an ounce of sulphuret of potassium dissolved in it.

Hydrophobia.—*Rabies.*

THE bite of the mad dog, or mad wolf, or other hydrophobic animal, is the most dangerous of all poisoned wounds, because it is apt to be followed by a disease for which there is no certain remedy. Fortunately, the human subject is not as susceptible to the effects of the poison as some of the lower animals; for only about one-tenth of those bitten are attacked by hydrophobia.

Symptoms.—The interval between the bite and the appearance of the disease varies from twelve days to two months. The wound heals like any other bite of a similar animal. After a time, the scar begins to have darting, lancinating pains, which, if it be a limb that was bitten, run up towards the body. Sometimes it feels cold, or stiff, or numb, or becomes red, swelled, or livid, and occasionally breaks open, and discharges matter. The patient feels a strange anxiety, is depressed in spirit, has an occasional chill, and disturbed

sleep, and spasmodic twitches. The pulse is above its natural state, both in quickness and strength, and the nervous system is very impressible. The senses are all more acute; trifling noises produce agitation, and the eyes are so disturbed by the light that the patient sometimes hides himself in a dark place. The appetite is lost. This is the first stage.

Thirst now appears, and he attempts to drink. But the moment water approaches his mouth, a spasmodic shudder comes over him; he pushes it back with horror; the awful fact of his condition flashes upon him; and he cries out, "What I have dreaded has come upon me."

Thenceforward he can swallow no fluids; complains of pain and stiffness about his neck; is thrown into convulsions by the sight of water, or even the sound of liquids agitated in a vessel, or by a breath of air blowing upon him, by a bright light, or by the glare of a mirror. His throat is full of a viscid, glary matter, which he continually tries to clear away. Thus, between convulsions, in which he struggles, and sometimes strives to bite his attendants, and comparative stillness, during which he suffers great depression of spirits, he passes three or four days, and then dies either in a spasm, or from exhaustion.

Treatment.—Immediate suction of the wound, with care being taken that the person whose lips are used has no abrasion or wounds there, followed by disinfection is certainly the best method, if resort cannot be had to some of the institutions where Pasteur injective treatment can be utilized. Disinfection may be carried out if the wound is a torn one, not a narrow and deep one, or in the latter case it would probably be better to cut away enough flesh so that the disinfectant may reach the bottom of the wound. The use of corrosive sublimate in the strength of one part to 500 of water applied to the wound for five or ten minutes and then a poultice of weak solution of one part to 3,000 of water applied and bound on. The corrosive tablet sold at all drug stores contains about 7 grains of poison, and dissolving one of these in a half pint of water makes a strength of one to 500; a strength 1 to 1,000 may be made by dissolving one tablet in a pint of water.

Some of the Western physicians declare the red chickweed, or scarlet pimpernell, to be an absolute remedy for this disease, and cite some quite remarkable cases of its success. Four ounces of this plant, in the dried state, are directed to be boiled in two quarts of strong beer or ale, until the liquid is reduced one half. The liquid is to be pressed out and strained, and two drams of laudanum added to it. The dose for a grown person is a wine-glassful every morning for three mornings. A larger dose is required if the disease have begun to show itself; and if the case be fully developed, the whole may be taken in a day. The wound is to be bathed with the same decoction. The medicine, it is said, produces profuse sweating. It is worth a trial.

Considerable has been said of late of a remedy used in some parts of Europe, and said to be effectual. It is the "golden cenotides" (*cetonia aurata*), or common rose-beetle, found in large quantities on all rose-trees. A similar insect is said to infest the geranium-plant. When collected, they are dried and powdered; and given in this form, relieve excitement (so it is said) of the brain and nerves, and throw the patient into a sound sleep.

Muscular and Nervous Derangements from Wounds.

IN some persons, a very small local injury will produce violent disturbance of the nervous system. Some will faint and be thrown into convulsions and vomiting from causes scarcely greater than the prick of a needle; and, before Morton gave the world the boon of ether, it was not very uncommon for persons to die under the knife of the surgeon. One of the most serious disturbances from wounds, of a nervous and muscular character, is

Locked Jaw.—*Tetanus*.

THIS is spasmodic contraction, with rigidity, or stiffness, of the voluntary muscles. Sometimes this rigidity is partial, at other times universal throughout the system.

Tetanus is produced by two causes, *exposure to cold* (idiopathic), and *bodily injuries*, particularly the *injury of a nerve* (traumatic tetanus). This last is the most frequent,—perhaps the only form of the complaint.

The Symptoms are long-continued, violent and painful contraction or cramp of the voluntary muscles. At first there is difficulty and uneasiness in turning the head, with inability to open the mouth easily,—then the jaws close gradually, but with great firmness; swallowing now becomes difficult, and a pain, starting from the breastbone, pierces through to the back,—probably caused by cramp of the diaphragm or midriff. The cramps now extend to the muscles of the body, the limbs, the face, the tongue, etc., which continue in a state of rigid spasm,—being swelled and hard in the centre,—till the disease yields, or the patient dies. At times the abdominal muscles are so tense as to make the belly as hard as a board. Occasionally the patient is drawn backward into the shape of a hoop, so as to rest on his head and heels (*episthotonos*); at other times he is drawn forward in the shape of a ball (*emprosthotonos*). All the contractions are attended with intense pain. It is the racking of the entire body with cramps like those which sometimes attack the calf of the leg. So violent are the contractions that the teeth are sometimes broken by them, and the tongue is often badly bitten. In the mean

time, the appearance of the sufferer is frightful. The forehead is wrinkled, the brow knit, the eye-balls motionless and staring, the nostrils spread, the corners of the mouth drawn back, the set teeth exposed, and all the features fixed in a ghastly grin.

The prevention of tetanus can be accomplished by thorough disinfection of all wounds, especially those due to gun-powder accidents and implements around stables and manure heaps.

In 1905 the number of cases reported following the July 4th celebration was 75 per cent. less than the previous year, owing to precautions taken. It is so fatal that somewhere about 70 and 80 per cent. of those who become affected die. The most valuable treatment is the injection under the skin by a competent person of the antitoxin of tetanus, but even this, to be successful, must be administered within a short time after the wound is made to prevent the poison from invading the nervous system and causing death.

Treatment.—At once upon the receipt of a wound which is suspicious the same treatment should be given as suggested for hydrophobia; on no account should the wound be closed over and allowed to heal in the early stages. If the disinfectants are not available it is much better to leave the wound exposed to the air, as the growth of these germs which is the cause of the disease is increased by exclusion of air. If the jaw becomes locked so that food cannot be taken, it may be necessary to feed the patient by means of a small rubber tube through the nostril or even the rectum, but a physician will, of course, have charge of the procedure. Ether and chloroform in desperate cases may be inhaled to ease the final struggle of the patient, or bromide of soda and chloral in large doses will also be useful.

Epilepsy.—Epileptic Fits.

THIS disease has been sometimes called the *falling sickness*, but generally passes under the more vague title of *fits*.

Symptoms.—The disease is characterized by a temporary loss of consciousness, strong spasms and intervals between the fits. The attack is sudden, generally without warning, and attended with a loud cry, when the patient falls down, is senseless and convulsed, struggles violently, breathes with embarrassment, has a turgid and livid face, foams at the mouth, bites his tongue, has a choking in the windpipe, and appears to be at the point of death. Presently, in from five minutes to half an hour, and by degrees, these symptoms diminish, and at length cease; and the patient falls into an apparent sleep. In a short time more he recovers, and is apparently well. These attacks come again and again, and at irregular intervals.

This is the worst form of the disease; there is another class of cases in which the symptoms are much lighter,—there being no turgescence of the face, no foaming at the mouth, no cry, no convul-

sions; but merely a sudden and brief suspension of consciousness, a fixed gaze, a feeling of confusion, or a totter, from all of which the recovery is speedy.

Causes.—These are numerous,—as worms, disturbance from indigestible food in the stomach and bowels, difficult teeth-cutting, nervous irritation, either direct or by sympathy, sexual excesses and masturbation, disease or injury of the brain or spinal marrow, gall stones in the excretory duct of the liver, stone or gravel in the kidneys and bladder, fright, distress of mind, passion, great loss of blood, and many others.

Treatment.—But little can be done during the fit, except to protect the patient from being injured by the violence of the convulsions and especially for unusual accidents that may happen while the victim is falling unconscious, such as burying the face in the pillow at night, choking due to the food stopped in the throat or falling of the body on hard substances causing breaking of the bones, even fracture of the skull. There is little fear that death will result. Cures are seldom obtained but the violence of the convulsions may be greatly diminished by proper treatment and the time occurring between attacks of greater length. The most important drug and the one tried which has given the largest number of happy results is the bromide of strontium, which drug as well as any chosen must be used over a long period of time and even after the improvement has been noticed. The use of the drug must be continued even over a matter of years in the dosage of 10, 20 and even 30 grains well diluted with water, three times a day, and in all probability an improvement may be expected. If as in a certain proportion of cases an attack is preceded by a premonition of its onset, the inhalation of the vapor of nitrite of amyl which can be purchased in pearls, and crushed in a handkerchief, the attack can be prevented.

In all cases, indeed, the diet should be carefully regulated, being light, nutritious, and easy of digestion. The sleep should be taken at regular hours, and daily exercise in the open air be insisted upon. The bowels must be kept regular, by the food, if possible; if not, by mild laxatives. Apply along the spinal column 195, once a day, rubbing it well in; also, now and then, mustard poultices.

In addition to these remedies, give pills of iron and quinine (72). one after each meal,—also oxide of zinc (270), which is one of our very best remedies. Of the pills, one should be taken three times a day. Bromide of sodium, 1 dram in 24 hours, mostly at bedtime.

We can seldom go amiss in giving medicine calculated to relieve nervous irritation, and to build up the general system. For this purpose, the valerianate of quinine, and the extract of black cohosh (79) are well adapted. Citrate of iron and strychnine (316), is a very valuable remedy.

It is said that a black silk handkerchief thrown over the face of a

person in a fit, will immediately bring them out of it. It is an experiment easily tried; and having seen it in a respectable medical journal, I give it for what it is worth. The bromides in large doses, long-continued, sometimes cure epilepsy (367).

Catalepsy.—Trance.—Ecstasy.

CATALEPTIC fits are simply what is known to all the world under the name of *trance*; and *ecstasy* is a modification of the same nervous disorder. It is a state in which the mind becomes so intensely absorbed in something outside of its earthly tenement, that it withdraws all control over the body, and all apparent connection with it, leaving it as if dead. There is a very light ticking of the heart, just perceptible to a cultivated ear, but the breast does not rise and fall with breathing, the features are all inexpressive and still, the eyes are wide open and motionless, apparently staring after the departed intellect; and the body and limbs are entirely passive,—remaining unmoved where they are placed by others, however tiresome and uncomfortable the position. In a word, a person in catalepsy is, in appearance, like a marble statue, or like a human body suddenly turned to stone, or, like Lot's wife, to a pillar of salt. There is as little feeling, or thought, or consciousness, as if the bowl had been instantaneously broken at the cistern, and the apparent death were real.

It is a peculiarity in this disease that the patient, on recovery from a fit, takes up the thread of conscious life just where it was broken by the attack. Thus, if she were lifting a cup of water to the mouth, she would hold it steadily, with the mouth open, till the return of consciousness, and then place it to the lips, as if no interruption had occurred; or, if conversing, and in the midst of a sentence, the unfinished words would be uttered at the end of the fit, even though it should last many days.

Persons in a cataleptic fit have much the appearance of one in the mesmeric state; and the statue-like position in which an attack fixes a patient, reminds one of the manner in which the psychologists, so called, will arrest a man under their influence, and make him immovable, with one foot raised in the act of stepping.

The disease attacks females much more often than males.

The premonitory symptoms are much like those of epilepsy, and the treatment should be about the same.

Saint Vitus's Dance.—Chorea.

THIS disease is chiefly confined to children and youth between the ages of eight and fourteen. But few cases occur after puberty.

Symptoms.—The complaint affects mostly the muscles and the limbs. It excites curious antics,—such as we should suppose would occur if a part of the muscles of voluntary motion had hatched a mimic rebellion, broken away from the control of the will, and in

sheer mischief and wantonness, were tripping their fellow muscles, and playing tricks with the patient. A few of the muscles of the face or limbs begin their mischievous pranks by slight twitches, which, by degrees, become more energetic, and spread to other parts. The face is twisted into all kinds of ridiculous contortions, as if the patient were making mouths at somebody. The hands and arms do not remain in one position for a moment. In attempting to carry food to the mouth, the hand goes part way, and is jerked back, starts again, and darts to one side, then to the other, then mouthward again; and each movement is so quick, and nervous, and darting, and diddling, that ten to one the food drops into the lap. If the attempt be made to run out the tongue, it is snatched back with the quickness of a serpent's, and the jaws snap together like a fly-trap. The lower limbs are in a state of perpetual diddle; the feet shuffle with wonderful diligence upon the floor, as if inspired with a ceaseless desire to dance.

It is supposed by some that the disease consists in a partial palsy of a part of the muscles. The will in that case not being able to control the palsied muscles, when it commands the others to move, their action is not balanced, and they twitch the face and limbs into all the capricious and fantastic shapes we witness.

Others, and probably with more truth, hold that the seat of the disease is in the cerebellum or little brain. It is supposed to be one of the functions of this organ to preside over and regulate the locomotion,—that it holds the office of chief engineer, and that its duties are to keep the muscles in subjection to the will. The combined and consenting action of several muscles is needed for every movement. It is the business of the cerebellum to maintain this oneness of purpose and action—to see that no muscle flinches so as to disturb the harmony of the movement. When the cerebellum is diseased, all is confusion,—just as the locomotive runs from the track when the engineer is smitten with palsy.

The disease is not dangerous, but when it continues for many years it is apt to weaken the mind, and it sometimes very nearly destroys it.

Causes.—Whatever excites and weakens the nervous system, as powerful emotions of the mind, overworking the mind, reading exciting novels, eating too much meat, fright, striking in of eruptions, self-pollution, etc.

Treatment.—In the first place, remove all causes of excitement. Take the patient from school, and require some sort of cheerful outdoor exercise, daily. Take away all books, and be careful not to do anything to occasion anger or fear, or any kind of injurious excitement. Apply spinal ice-bags gradually and regularly.

In the second place regulate the diet—making it more animal and stimulating if it has been too low, and more vegetable and cooling if it has been too high.

In the third place, if the above changes have not been sufficient for the purpose, open and regulate the bowels with some gentle physic (30), (34) for a few days.

Iron in the form of tincture of the chloride of iron, 10 drops in water taken through a tube after meals, and arsenic in the form of Fowler's solution must be used for the anæmia, which is so often present. This latter drug is a strong solution of arsenic and must be used with great care, given in a dose for a young child 2 or 3 drops well diluted with water three times a day, gradually increasing a drop a day up to 8 to 10 drops three times a day, which is the maximum amount; it is not safe to increase more. The danger of poisoning must be looked for, such as a puffiness about the eyes and nose, or pains and cramps in the stomach. They show that the patient is getting a little more than is sufficient. The drug should then be cut down about half and continued at the last amount or entirely stopped. If there is a rheumatic history the salicylate of soda in 5 to 10 grain doses three times a day must be used. Next to arsenic, sedatives, such as bromide of soda or hyoscyamus or better than all the fluid extract of *cimicifuga* in the doses of half a teaspoonful diluted with water twice a day often proves a help.

To these remedies should be added the shower-bath, beginning with tepid water, and making it a little colder every day. If the shower-bath frightens the patient, or is not otherwise well borne, take the sponge bath.

Chronic Chorea.

THIS can hardly be said to amount to a disease. It consists rather in uncouth tricks, arising from some slight disorder of particular muscles, and grown into a fixed habit, such as shaking of the head every three to twenty seconds, repeated squinting of the eyes in connection with a peculiar knitting of the eyebrows, wrinkling of the nose, shrugging of the shoulders, lifting the ears up and down, or even moving the whole scalp back and forth. These movements are commonly made without a consciousness of it; and generally there is no power to suspend them without a painful effort which cannot be easily continued.

No medical treatment is of any avail. These tricks can only be corrected by great watchfulness and effort on the part of the person suffering from them, and in many cases, not even by such means.

Cramps.

CRAMP is experienced in the calves of the legs, the thighs, the stomach, the breast, the womb, etc. It is a very painful, sudden, and violent contraction of one or more muscles. The part is sometimes, as the phrase is, "drawn up into knots." When it attacks the stomach, it is a very dangerous affection. Women are subject to it about the third or fourth month of pregnancy.

They occur more frequently at night as the result of over-fatigue and indigestion during the day. These spasmodic contractions often occur in the abdomen and are accompanied by diarrhœa due to indigestion. Abdominal cramps are also a symptom of locomotor ataxia and other spinal diseases. The cramp of swimming is often due to an over-straining of some one group of muscles not hitherto much used, the sudden fatigue causing cramp. They may be also of nervous origin. Rheumatism is not infrequently the sole cause of painful muscular spasms.

Causes.— Drinking cold water when very hot and perspiring, exposure to damp night air, debility, indigestible food, and excesses in eating and drinking, and particularly over-straining the muscles.

Treatment.— Moderate the excessive labor and straining of the muscles which produce the cramps. When an attack occurs in the legs, tie a cord or handkerchief tight around the leg above the affected muscle. This will generally produce instant relief. Also briskly rub the parts with hot water, alcohol, ammonia, spirits of camphor, paregoric, or laudanum.

When it occurs in the stomach, apply warm fomentations, or what is better, a mustard paste (165). Take hot jamaica ginger or neuropathic drops. The bowels, if confined, should be opened with an injection.

Cramps of the limbs which afflict women in the family way, can only be mitigated, not cured, till after confinement. As a palliative, high cranberry bark, scullcap, etc. (87), will be found useful.

Pain of the Nerves.—*Neuralgia*.

THIS disease affects one tissue only,—the *nervous*; and has one symptom,—*pain*.

In *apoplexy*, the nerves, rendered powerless and senseless by an external force, are like a man under a bank of earth which has slid down upon him. In *palsy*, they are suddenly bereft of feeling and motion by a blasting scourge within,—as one is smitten down by a pervasive charge from a magnetic battery. In *epilepsy*, the nerves are grasped and for a time held senseless by an unseen power, in which they struggle, as a man strives in the folds of the anaconda. In *cataplexy*, they are suddenly stiffened into senseless strings, for such automatic use as the bystander may, for the time, choose to make of them. In *chorea*, they are set to dancing by an invisible exhilaration, as a man is suddenly crazed by brandy.

In *neuralgia*, the nerves are neither crushed, nor collapsed, nor restrained for a time, nor stiffened, nor exhilarated. They simply have their sense of feeling intensely exalted; they are filled with *pain*. The pain is generally of a peculiarly darting, piercing character. The patient sometimes calls it tearing pain. It comes on in sudden paroxysms, with intervals of freedom between. The attacks are some-

times like an electric shock, and are so agonizing as to bring a temporary loss of reason. Occasionally there is great tenderness of the parts affected, and some fulness of the blood-vessels in the neighborhood; but generally the signs of inflammation are all absent, except pain.

Neuralgic pains occur in almost every part of the system. One of the most familiar forms of the disease is known under the name of

Tic Douloureux.

It occurs in those branches of the fifth pair of nerves which go to the face. (See Fig. 85.) Sometimes one, sometimes all of the three branches are affected, but more often the middle branch only. When the upper branch is the seat of the disease, the pain is in the forehead, the brow, the lid, and sometimes the ball of the eye. The eye is generally closed during the pain, and the skin of the forehead is wrinkled. When the affection is in the middle nerve, the pain is preceded by a prickling sensation in the cheek, and twitching of the lower eyelid. Soon it spreads in quick and piercing pangs over the cheek, reaching the lower eyelid, the sides of the nostrils, and the upper lip. If in the lower branch, it sends its lightning shafts to the chin, the gums, the tongue and even up the cheek to the ear.



FIG. 85.

Face-Ache.—There is a species of nervous pain called *face-ache*, which does not quite amount to tic douloureux, but is nevertheless very afflictive. It occurs principally in the jaw, which seems to be filled with pain. No one spot seems to be more affected than another. From the jaw the pain often goes to the whole head, but it has not the stabbing intensity which generally characterizes neuralgia. It often proceeds from defective teeth.

Hemicrania.

THIS is a neuralgic pain, confined to one side of the head,—generally the brow and forehead. Sickness of the stomach often attends it, and in many cases it is periodical,—coming on at a certain hour every day, and lasting a given time, and then passing away.

It may be caused by whatever debilitates the system, as hysterics, suckling an infant too long, or low diet. In fever and ague districts it is frequently produced by miasm. In many instances, the cause cannot be discovered.

Sciatica.

THIS is a pain beginning at the hip, and following the course of the sciatic nerve. Occasionally it is an inflammatory complaint; sometimes it is connected with an affection of the kidney; but frequently it is a purely neuralgic or nervous pain; and I have therefore thought it best to place it here, with nervous diseases.

Besides the various forms of neuralgia now noticed, the disease occurs,—sometimes with great severity,—in the female breast, in the womb, in the stomach, in the bowels, in the thighs, in the knee, and even in the feet. In many of these cases the disease is not where the pain is felt, but in the brain or spinal marrow, and consequently the true source of the complaint very often escapes detection. An excellent Episcopal clergyman in Northern New York, the Rev. M. B——, with whom I studied Latin and Greek preparatory to college, had a neuralgic pain in the knee so intense, persistent and exhausting, that the limb had to be cut off at the thigh to save his life.

Treatment.—This must be as diversified as the causes of the disease. For a general R use 368.

For tic douloureux, and some other forms, given internally, valerianate of ammonia (88); also 89, 90, 91, 92, 93, 316, and 84, as tonics.

For external use in tic douloureux, and other neuralgic affections, the prescriptions 188, 196, 197, 198.

For the face-ache, above mentioned, muriate of ammonia (134), in half dram doses, is a very valuable remedy.

When the disease is caused by miasm, and has a periodic character, like ague, it must be treated with quinine (67), (79), and if there be a low state of the blood, iron (72), (93) must be given at the same time. The galvanic battery often acts like magic in neuralgia.

The shower-bath, exercise in the open air, and whatever else will build up the general health, must be used according to circumstances.

Neuralgic pain of various kinds often yields readily to some one of the many coal-tar products like phenanthrene, antikamnia and ammonol: say 10 grains of either every two to four hours according to the intensity of the pain. The last named product is quite harmless and produces no numbness or faintness which is said to follow at times the use of some of the others.

Avoid rich or fatty foods. Live on a plain nourishing diet. Take exercise out of doors as much as possible.

Derangement of the Mind.—Insanity.

Most writers on this disease have attempted a *definition* of it. I have never seen one which suited me. Here is mine. *Insanity is a wrench of man's nature, which sets his intellectual and moral faculties awry in their relations with the external world.*

In a state of mental and moral health, he looks straight at the outward world, and sees it *as it is*; insanity gives him an angular connection with it and he sees it *as it is not*; its objects have all changed their relative places; objects at the right in the panorama of life have moved to the centre, or gone quite over to the left; while things at the top have gone to the bottom, and those in the lowest places have taken the highest. With the thoroughly insane, *the world has gone back to chaos*.

These persons have their sensibility very much altered and perverted. Errors of the senses and illusions cheat them. In many cases, they cannot read because the letters are mingled in a confused mass. They often do not recognize their friends, and regard them as strangers or enemies.

They become awkward in the mechanical use of their hands, and their touch loses the power to correct the errors of the other senses. Hence they are cheated in regard to the size, form, and thickness of bodies.

They are haunted, at times, with smells which have no existence, and they hear voices distinctly speaking to them from clouds, or from trees; and these voices have the familiar tones of a friend, relative, or enemy.

The insane lose the power of comparing ideas. They associate things the most unlike, and often in a ridiculous way.

They also lose the control of themselves, and come under the dominion of their passions; and then they will do acts which they themselves disapprove. One of strict integrity, of unblemished morals, and of excellent standing, becomes insane, and immediately steals what he does not want, makes infamous proposals, and indecent gestures, and is in every respect the opposite of his past self.

The insane often become averse to those who were previously among the most dear to them. For acts of kindness, they repay abuse. They fly from their best friends. This is the result of their fear and jealousy; for they are very cowardly and jealous. This alienation from friends is almost a characteristic of insanity, and is one of its saddest features. The moral affections are always disordered, perverted, or annihilated in insanity. So much is this a leading feature of the disease, that it is only when the insane begin to recover their moral affections, when they begin to wish to see their children and friends, to fold them once more in their arms, and to enter the family circle and renew its joys, that we can count upon any certain signs of a cure.

The insane have a thousand strong fancies in regard to themselves. One thinks himself inspired of God, and charged with the conversion of the world; while another, equally sincere, believes the devil has entered into him, and that the pains of hell are already taking hold of him, and he curses God, himself, and the universe. Still another is the "monarch of all he surveys," and much more; he governs the

world, and directs the stars. One has all knowledge, and affects to teach the wisest. Another is proud, and withdraws from his fellows, bidding them not to come into his presence without proper acts of homage,—calling himself, it may be, a king.

There are five kinds of insanity. I will speak of each of them briefly.

Melancholy.—*Lypemania*.

THIS is characterized by moroseness, fear, and prolonged sadness. The melancholic person is lean and slender, with black hair, and a pale and sallow countenance. His skin is brown or blackish, and dry and scaly. His physiognomy has a fixed appearance, the muscles of the face are drawn tight, the eyes are motionless, and directed to one point, the look is askance and suspicious, and the general expression is one of sadness, fear, and terror. He desires to pass his days in solitude and idleness. He walks as if aiming to shun some danger. His eye and ear are on the watch for evil.

These persons do not sleep much. They are kept awake by fear, jealousy, and hallucinations. If their eyes close, they see phantoms which terrify them.

Their secretions are disordered. The urine is either abundant and clear, or scanty and muddy. They sometimes retain their urine for days. One patient did not dare to make water lest he should drown the world, but was finally persuaded to it by the assurance that he would extinguish a fire which was devouring a city.

Insanity on One Subject.—*Monomania*.

THIS is a chronic affection of the brain, not attended by fever, and characterized by a derangement of the intellect, the affections, or the will, upon one subject only. The patient seizes upon a false principle, and draws from it injurious conclusions, which modify and change his whole life and character. In other cases the intellect is sound, but the affections and disposition being perverted, their acts are strange and inconsistent. These they attempt to justify by plausible reasoning.

Mania.

THIS is also a chronic affection of the brain, generally without fever. The countenance of the maniac is sometimes flushed, at other times pale. The hair is crisped; the eyes injected, shining and haggard. Manicas dislike the light, and certain colors horrify them. Their ears are sometimes very red, and are disturbed by a tingling, and a rumbling sound. Noise excites and disturbs them. They suffer from false sensations, illusions and hallucinations; and their ideas come with great rapidity, and are confused and without order. Their

affections are in a state of turmoil, and their judgments are all erroneous.

Unlike the monomaniac, their delirium extends to all subjects. Their entire intellect, affections and will, are a cahotic wreck.

Dementia.

HERE is another chronic affection of the brain, without fever, in which the sensibility, the intellect, and the will, are all *weakened*. Demented persons have not the power to concentrate their minds on anything, and can form no correct notions of objects. Their ideas float after each other without connection or meaning. They speak without any consciousness of what they are saying.

Many of them have lost their memory, or, like old persons, they remember nothing recent,—forgetting in a moment what is just said or done.

The demented have neither desires nor aversions; neither hatred nor love. To those once most dear to them, they are totally indifferent. They meet friends long absent without emotion, and part from their dearest ones without a pang. The events of life passing around them awaken in them no interest, because they can connect themselves neither with the past nor the future; they have no remembrances nor hopes. Their brain is inactive; it furnishes no ideas or sensations. They are no longer active, but passive beings; they *determine* nothing, but yield themselves to the will of others.

They have a pale face, a dull eye, moistened with tears, an uncertain look, and a physiognomy without expression. They sleep profoundly, and for a long time, and have a voracious appetite.

Idiocy.

IDIOCY is in the condition in which the intellectual faculties have never been manifested. We are not to infer disease from it, any more than we infer it in the lower animals from the absence of intellect.

In idiocy there is no mind, because the brain is not large enough to be the organ of intelligence. It always dates back, therefore, to the beginning of life. Everything about the idiot betrays a defective organization. The demented person, the monomaniac, etc., once had intelligence; the idiot, never. They, in many cases, may be cured; he is hopelessly incurable. They had blessings which have been taken from them; to him, none were ever given. They were once the pride and hope of their friends; he, from his birth, was the smitten and blasted one of his family. He never reaches an advanced age,—rarely living beyond thirty years.

These remarks are sufficient to show the difference between idiocy and other forms of mental derangement. In the other forms of insanity there are brains enough, but they are *diseased*; in this there is no disease; the smallness of the brain is the primal and fatal defect.

This form of mental derangement is caused by a defective development of the brain. That the other forms are produced by *disease* of the brain, there can be no doubt.

Some have supposed insanity to be a *mental* disorder merely, having nothing to do with the body. They might as well suppose the delirium of fever to be a disease of the mind only.

Insanity is an unsoundness of the brain and nerves which proceed from it, in every instance. At first it is probably only excitement of the brain; but this, long continued, becomes a chronic inflammation. The brain and nerves of an insane person are undoubtedly sore, and hence the painful thoughts and feelings which afflict them. When the soreness is much increased, they are violent and furious; when it subsides, they are calm. In consequence of this inflammation and soreness of the brain, an insane person can no more think, or reason, or will, or feel correctly, than a person with an inflamed stomach can digest food well, or than one with inflamed eyes can see well.

Causes of Insanity.—Hereditary predisposition; painful subjects of thought or feeling long revolved in the mind; injured feelings which cannot be resented, mortified pride, perplexity in business; disappointed affection or ambition; great political, religious, or social excitements; sudden and heavy strokes of misfortune in the loss of property and friends; and in general, whatever worries the mind for a long time, and creates a deep distress, may be a cause of insanity.

But one of the most prolific causes, and worthy of special mention, is masturbation, or self-pollution,—a vice contracted by thousands of young people, both male and female.

Besides the above, I may mention several physical causes, as convulsions of the mother during gestation, epilepsy, monthly disorders of women, blows upon the head, fevers, loss of sleep, syphilis, excessive use of mercury, worms in the bowels, and apoplexy.

Chances of Cure.—Idiotism is never cured.

Melancholy and monomania are cured when recent, and do not depend upon organic disease.

Dementia is sometimes, though seldom, cured.

Chronic insanity, of long standing, is not easily cured.

Insanity which has been produced by moral causes, acting suddenly, is generally curable; if the causes have acted slowly and long, the cure is more doubtful.

Excessive study causes insanity which is hard to cure.

If caused or continued by religious ideas, or by pride, it is not often cured.

Insanity caused and maintained by masturbation is cured with great difficulty.

Treatment.—The treatment of the insane is now almost confined, as it should be, to public hospitals. In these institutions, all the means are provided which humanity has been able to devise, to lift

from these unfortunate beings the terrible shadow which is upon them. Here they have safety, comfort, recreation, friendly guardians, rest, and medicine.

They have safety from the annoyances which well-meaning but mistaken friends at home almost always commit in contradicting, and reasoning with, persuading, and threatening them; for only in these humane institutions has it been well learned that to do so is no wiser than to persuade, scold, or threaten a neuralgic pain in the face, an inflammation in the stomach, or a felon upon the finger. They are safe, too, from the impertinent scrutiny of neighbors, the hootings of unthinking boys in the streets, and especially from the causes, whatever they are, which have produced the disease. And so far, this is just the treatment they want,—no contradiction, no impertinent scrutiny from neighbors, no abuse in the streets, and a withdrawal of the causes which have produced the disease.

In these institutions, too, they have comforts. They have clean rooms, galleries, lodges, bathing-rooms, yards and gardens for exercise and walking, safe, quiet, well-aired bed-rooms, and clean and comfortable beds; cheerful dining rooms, and plain, wholesome, and nutritious food. And this, likewise, is the treatment they require.

They have recreation,—dances, cards, back-gammon, chequers, chess, billiards, nine-pins, walking parties, riding parties, gardening, and an indulgence in those arts of painting, music, drawing and architecture for which they may have a taste. And such recreations are powerful instruments in the cure of all disorders of the nervous system.

Here, too, they have friendly guardians, who have long studied their complaints, and have imbued their souls with a sympathy which goes down into the depths of their sufferings, and allies itself with all their sorrows;—men and women who are willing to act the part of guardian angels; to be their friends; who know how to gain their confidence; and who use the influence acquired by love, in leading them back towards health and happiness. And this, too, in curing the insane, is of great consequence, for none can do them good till they have their confidence, and this can be gained only by love and wisdom.

In these insane asylums, they find *rest*. When the brain is hot from inflammation, and they are raving from delirium, they are here withdrawn from the noisy crowd, and shielded from the rude shocks of the world. If need be, they are placed in solitary rooms, where silence spreads its soothing stillness through their excited brains. And it is of the greatest importance that the sore and torn feelings should rest; for rest allays excitement, and brings sleep; and without a proper amount of sleep recovery is not possible.

Finally, in these institutions, they receive the best *medical* treatment. They have warm and cold bathing, judiciously administered; they have simple cathartics when the bowels are bound, as salts, cas-

tor oil, and magnesia; tonics for debility, such as quinine, iron, cassia, columbo, chamomile; and quieting medicines for their excitement, such as opium, morphine, cicuta, hyoscyamus, belladonna, stramonium, scullcap, and valerian. Prescription 74 is a combination much used. Here, too, broth, gruel, and milk, are administered by the forcing pump to such as take a fancy not to eat,—an expedient which has saved many lives. Fruits of all kinds, as strawberries, cherries, currants, plums, apples, peaches, and grapes, are allowed freely. Cold water, sweetened or otherwise, is the drink. To these things are added lively conversation, and whatever will divert the mind from reflection, and internal imaginings and revery.

Thus I have indicated, very briefly, the treatment which the insane receive in public institutions. That the chances of recovery in these humane retreats is much greater than at home, does not admit of a doubt. When it is not convenient to send an insane person to a hospital, the treatment should be as near like the one here sketched as circumstances will permit.

Hypochondria.

THE common names of this disease are *low spirits*, *spleen*, *vapors*, *hypo*, and *the blues*. It produces constant fear, anxiety, and gloom. Business, pleasures, the acquisition of knowledge, and all the useful pursuits of life, become insipid, tasteless, and even irksome to the hypochondriac. His mind is full of the belief that something dreadful is about to befall him. He is either going to be sick, or to die, or lose his property or friends. He has no mind to engage in any business, nor does he wish to go anywhere, or to see anybody. Night and day his spirits are down to zero, and his heart has a load too heavy to bear. He is wholly occupied with his troubles and his feelings. He thinks he has various diseases, and wears out his friends by talking of his sufferings. He feels of his pulse often, looks at his tongue in the glass, and several times a day asks a friend if he does not look pale or sick.

The external senses manifest symptoms of derangement as well as the thoughts, feelings, emotions, and passions. There are roarings in the ears, like a waterfall, or the noise of a distant carriage. Floating black specks, or bright sparks, are seen before the eyes. These indicate a slight fulness of the blood vessels, and perhaps, in some instances, sparks of electricity passing to or from the eye, and are in no proper sense subjects for the alarm they cause. At one time the person will feel as large as a barrel, at other times not larger than a whip-stock; the head will feel light or heavy, large or small. The skin will twitch in different parts, or feel numb, or have the sensation of spiders crawling on it. The smell and taste become perverted; the hypochondriac will smell odors and flavors, at times, where there are none.

These errors of the senses are all owing to some slight disorder of the organs of sense; and they are no more wonderful than that the mind should perceive personal danger, poverty, and death itself, when none of these things are impending.

These persons are subject to fainting turns, when the breathing will appear to stop, the body become cold, the face pale; there will be distress in the region of the heart, which will apparently stop beating, and the person will feel as if dying. At the same time the mind will remain clear. These nervous spells are alarming, but pass off without danger.

These persons become changed in their moral dispositions. They are jealous, take a joke as an affront, and feel the greatest distress at any apparent lack of attention or neglect on the part of friends. They put the worst construction upon the actions of friends. They are irritable, fretful, peevish, and fickle.

The complaint is distressing, but does not appear to shorten human life.

The seat of the disease is in the brain and nerves. It is caused by anxiety, care, disappointment, working the brain too hard, diseases of the liver and stomach, costiveness, sedantary habits, excessive venereal indulgence, and masturbation.

Treatment.—This disease is more easily prevented than cured. It would be almost entirely prevented in this country if in childhood we were all taught to be contented with humble competence, to love active labor, and to think it honorable, instead of struggling after wealth, and falling into unhappiness when it does not come.

Remedies.—Of all the remedies for this complaint, that which is most important is active employment out of doors. The human body was made for motion. Without it the blood cannot be distributed to the several organs. The senses, — the eye, the ear, the touch, — should be much in communion with nature. In this way they are strengthened. Nature is their great physician. Man is a creature of sensation; and if too much occupied with feelings, thoughts, and deep reflections, the nerves will be irritated, and begin to give deceptive sensations. A very nervous man should fly to some active occupation, if he would be rid of suffering.

The open, fresh air is very important to restore the system to soundness.

Temperance, both in eating and drinking, will do much for this class of patients, yet they are the very persons who eat largely, and they often fly to excessive use of stimulants to drive away their sorrow. By so doing, they aggravate the disease.

Amusements are very important for hypochondriacs. Lively company, cheerful and witty conversation, with mirth and laughter, lively songs and instrumental music, are all desirable; and so are gunning, fishing, riding, billiard-playing, and travelling.

Never allow these patients to be alone, and to have time to brood over their misery. See that they go early to bed, and rise betimes in the morning. The warm bath, the cold shower, or sponge bath, with brisk friction, are not on any account to be omitted. The diet should be light, nutritious, and generous; but fats, acids, liquors, and coffee, must be forbidden.

But little medicine will be required. If there be costiveness, let cracked wheat be eaten; if this does not answer, a little rhubarb and bicarbonate of potassa (35), or leptandrin, podophyllin, etc. (36), may be given as required by the symptoms. A teaspoonful of calcined magnesia once a day, or the infusion of thoroughwort, drank cold, will often answer an excellent purpose. A bowl of warm motherwort tea, with a teaspoonful of spirits of camphor in it will do well in fits of fainting when there is a sensation of dying. A teaspoonful of sulphuric ether may be given at the same time. If there be debility, tonics are sometimes useful (50), (49), (54), (55).

Hiccough.—*Singultus*.

THIS is a sudden, jerking spasm of the midriff, occurring every few moments in bad cases, causing the air to be driven out of the lungs with such suddenness as to produce a noise something like the involuntary yelp of a puppy. It is generally caused by acidity of the stomach, which irritates the nerves distributed to its neighborhood, and is not difficult to remove; but when it occurs towards the close of some acute and grave disease, it is sometimes a sign that dissolution is at hand.

Treatment.—Startle the person suffering, by exciting surprise, or fear, or anger; or let a few small draughts of cold water be taken in quick succession; or, let the breath be held as long as possible. If the stomach is sour, take a teaspoonful of bicarbonate of soda, dissolved in half a tumblerful of cold water. To expel wind from the stomach, if it be present, take some warm aromatic essence of peppermint, ether, or compound spirits of lavender. But one of the most effectual remedies is *heavy pressure made upon the collar bones*. It is simple, and very effectual. Cocaine, one-eighth grain every fifteen minutes, is a very simple and often efficacious remedy.

Fainting.—*Syncope*.

FAINTING is preceded by a distress about the heart, a swimming of the head, sometimes sickness at the stomach, coldness of the hands and feet, and a loss of sight, or *a sense of things growing dark*. The breathing diminishes, the pulse becomes small, the face deadly pale, and the patient wilts down, and becomes more or less unconscious of what is passing around.

Whatever causes debility, particularly of the nervous system, will

predispose to fainting. Persons much weakened by disease, faint easily, especially when they attempt to stand still. When on their feet, such persons should keep moving. Fainting is sometimes induced by sudden surprises and emotions, by violent pains, by the sight of human blood, and by irritation of the coats of the stomach by indigestible food.

Treatment.—Lay the patient upon the back, with the head low; let fresh air into the room instantly, and apply gentle friction. Sprinkle a little cold water upon the face, and hold spirits of camphor, ether, hartshorn, or vinegar to the nose,—rubbing a little of the spirits of camphor upon the forehead, and about the nostrils. As soon as the patient can swallow, give a teaspoonful of compound spirits of lavender, with ten drops of water of ammonia in it.

Persons subject to fainting should not go into crowded assemblies where the air is bad; neither should they wear tight dresses, or allow themselves to get excited. Cold bathing, a well-regulated diet, and vegetable tonics, will do much to break up the habit.

Dizziness in the Head.—*Vertigo*.

THIS affection makes objects which are stationary appear as if moving, or as the phrase is, “turning round.” When seized with it, one will have a sensation as if falling, and objects about him will seem to be in motion.

It is caused by irritation of the nerves of the stomach in dyspepsia, by long application of the mind, by a weakened nervous system, by hysterics, and by a fulness of the blood-vessels of the head. When it proceeds from most of these causes, it is not dangerous; but when caused by impending apoplexy, it is a symptom of very serious import.

Treatment.—Find out the cause and remove that, and the dizziness will disappear. If it come from dyspepsia, eat lightly; if from costiveness, open the bowels either by coarse food, by daily cold water injections, or by some gentle physic. Avoid coffee, ardent spirits and late suppers, and take much exercise. Keep the feet warm, and the head cool. See to the liver and heart.

Disturbed Sleep.—*Nightmare*.—*Incubus*.

IN this complaint the sleep is disturbed generally by some frightful image. Whatever of an alarming character is presented to the mind in sleep, causes fear, or some other painful emotion, the same as when awake. And when the attempt is made to resist, or to flee from the danger, it is ineffectual, because the muscles are locked fast in sleep. The fear being increased by the inability to escape, the sleeper makes all sorts of horrible noises, indicating distress of mind. The danger seen is as real to the sleeper as if he were awake, and he

tries to do just what he would if awake. Sometimes the sensation is that some heavy weight, or perhaps some horrible monster, is upon the breast, nearly pressing the breath out of the body.

At times, the power of motion is not absent, and then disturbed dreams may cause one to talk, or to rise and walk, or run. Children will laugh or cry, or scream, which shows that their minds are agitated by different passions. Persons who indulge in gloomy and troublesome thoughts in their waking hours are apt to be disturbed with sleep-walking, sleep-talking, and frightful dreams, as of falling down precipices, during the hours for repose.

There is nothing very wonderful about these disturbances of sleep. It is only necessary that there should be an unusual sensitiveness of the brain, or that a hearty supper, eaten late, should irritate the nerves of the stomach, and that distressing thoughts should be dwelt upon during the day and evening, in order to produce all the walking, talking, dreaming of hobgoblins, shipwrecks, fires and polar bears, which distress so many unfortunate sleepers.

In night-walking there is simply a little more wakefulness than in night-talking, and in this latter, more than when one falls from a high place, and in this perhaps slightly more than in real *incubus*, when one is in the greatest peril, but cannot move at all.

Treatment.—When sleeping persons groan, or make any noise indicating nightmare, *shake them*, and they will come out of it at once. As these troubles are often caused by a weakened state of the nerves, much out-door exercise should be taken. The diet should be simple, and well regulated. The suppers should be light, and never taken late. The evening should be spent in some pleasant amusement, which will drive away care; and the last hours of wakefulness be occupied with pleasant reflections. One afflicted with nightmare should not lie upon the back, nor with the hands over the head. Acidity of the stomach, and costiveness, if they exist, should be removed by neutralizing mixture.

Headaches.

THESE are not always caused by disorders of the brain and nerves, but they frequently are, and this seems the proper place to speak of them.

It is unwise ever to neglect headaches. They are sources of great suffering, and often lead to serious derangements of the health. In childhood they have a more serious meaning than in adult life. They often indicate the approach of scarlet fever, or measles, or of other diseases.

Headaches are more common among the civilized than the uncivilized; more frequent among females than among males; among those of sensitive feeling than among the more obtuse; among those who think much than among those who think little; among the sedentary than among the active.

Causes of Headaches.—They are dependent on various causes, as derangement of the circulating system, of the digestive organs, of the nervous system, etc. Among those dependent on disturbance of the circulation, are

Headaches from Eye Diseases.—Myopia, or near-sightedness; Hypermetropia, or far-sightedness; Astigmatism, or the inability to see equally well horizontal and vertical lines, as well as other irregularities of vision, are frequent sources of headache. These headaches are caused by overtaxing certain groups of muscles, or by fixing the eyes too long on one objective point, as experienced in prolonged study or reading, especially under unfavorable circumstances. These headaches are more or less similar in their symptomatology. The ache is generally dull, situated mostly in forehead and over eyes, but may also be spread from base of brain to the eyes; oftentimes it is accompanied by nausea, especially after prolonged use of eyes under improper conditions.

The treatment of these headaches consists in absolute rest of the eye, in case of overwork, and the fitting, by a competent oculist, of such glasses as will rectify the irregularity in the eye proper.

Astigmatism is a common source of headaches, and often is so insidious in its development as to escape attention. A rough test may be made by drawing several horizontal and several vertical lines in close proximity, and then placing at some distance (15 to 20 feet) from the eye. If either set cannot be as clearly seen without blurring as the other, you have good cause to suspect Astigmatism, and should consult an oculist. Do not dally with these eye-headaches, as you will be doing a permanent injury to your eyes.

Tea and Coffee Headaches.—In the nervous, and oftentimes in the gouty and rheumatic person, the use of tea or coffee will cause violent headaches. Tobacco likewise after prolonged use shows a tendency to headaches. These luxuries of life should be discontinued at once for at least one month. An extra strong cup of black coffee, to be sure, will stop the headache for the time being, but only adds fuel to the fire in the long run. Bromo-caffeine, as ordinarily sold by the druggists, taken in teaspoonful doses every half hour, will relieve the malady. We would strongly advise any one that has constant or periodical headaches, if he uses either tea or coffee, and especially coffee, to leave them off entirely for three months. It may be the sole cause, and if caused by tea or coffee, there is no possibility of their cure by medicines while you continue their use.

Plethoric Headaches.—These are dependent on a general fulness of blood. They are of two kinds. One is occasional, and lasts but a few hours. The other lasts for days or weeks. It occurs most often in the night or morning. Persons whose occupations require stooping have it most. A little dizziness is generally felt on rising up from a stooping posture. It is brought on by the bad air of

crowded rooms, and is attended by costive bowels, short breath, and a white furred tongue.

The persistent headache is accompanied by a sense of fulness, and sometimes of throbbing over the brows and temples, with a sensation of dizziness, and of mist before the eyes. The sufferer fears exertion and is constantly looking for a rush of blood to the head. Nature sometimes relieves this form of headache by a diarrhœa, or by bleeding from the nose.

There is another form of plethoric headache, differing slightly from the above, in which there is too much blood, and it is made too fast, but it does not circulate so rapidly. The muscles are not very firm, and the heart does not propel the blood with much force. This form of headache is connected with *congestion*.

Headaches of Indigestion.—These are caused either by taking improper articles of food, or by eating too much of those which are proper. The sensation in the head is not always a pain, but sometimes only a dull weight, attended by languor and disinclination for exertion; a tongue white in the centre, and pale red at the tip and edges; cold and numb fingers; slight nausea; languid and feeble pulse; dim and indistinct sight; eyes aching when employed; and difficulty in fixing the attention.

Sick Headache.—This has received its name from the constant nausea or sickness at the stomach which attends the pain in the head.

This headache is apt to begin in the morning, on waking from a deep sleep, or after sleeping in a close room, and when some irregularity of diet has been committed on the day before, or for several previous days. At first there is a distressingly oppressive feeling in the head, which gradually merges into a severe, heavy pain in the temples, frequently attended by a sense of fulness and tenderness in one eye, and extending across the forehead. There is a clammy, unpleasant taste in the mouth, an offensive breath, and the tongue covered with a yellowish-white fur. The sufferer desires to be alone, and in the dark. The hands and feet are cold and moist, and the pulse feeble.

Accompanying these symptoms, there is a depressing sickness at the stomach, which is increased by sitting up, or moving about. After a time, vomiting comes, and relief is obtained.

Bilious Headache.—This is most common in summer and autumn. It afflicts persons of dark complexion with black hair and melancholy dispositions. There are two kinds, one is due to an accumulation of bile in the system; the other, to a large secretion of bile.

In the first variety the skin is dingy and sallow, the spirits depressed, the bowels costive, and there is wind in the stomach, with a dull aching pain on the right shoulder. The pain is in the forehead,

eyebrows and eyelids, and the "white of the eye" is a little yellowish. The tongue has a brown fur, and is cracked in the centre. There is a bitter taste in the mouth on waking in the morning, after restless nights, and frightful dreams.

In the second variety, which is due to an "overflow of bile," the symptoms are much like those of the first kind, but the pain is not so continuous. In addition to the symptoms named, there is a throbbing, rending pain in the head, the skin is hot and the face flushed, the limbs are sore, and there is a luminous halo or ring around objects looked at, and a feeling of giddiness.

Nervous Headaches.—These are more common among females than males. They occur most frequently among persons of high susceptibility, who are easily elevated, and as easily depressed. They are often connected with indigestion.

The pain is usually acute and darting, and is made worse by light, with a feeling as if the temples were being "pressed together," and a "swimminess" in the head. There is sometimes a sense of sinking, with a dread of falling, and great despondency and restlessness. The bowels are generally costive, and the sight dim. The pain comes on most commonly in the morning, lasts through the day, and abates in the evening.

Hysterical Headache.—There is a nervous headache dependent on the *hysterical* condition. It is generally confined to one small spot, frequently over the eyebrow, and is sometimes compared to a wedge or nail driven into the skull.

Headache from Exhaustion.—Still another species of nervous headache arises from extreme exhaustion, produced by great loss of blood, by diarrhoea, or by over-suckling. The pain is generally on the top of the skull, and is often compared to the beating of a small hammer on the head.

Brow Ague.—This is intermittent in its character, and is brought on by exposure to cold and moisture in damp and marshy districts; and in this respect is much like ague.

Megrims.—This is most frequent among females. It is often dependent on the same causes as Brow Ague, and is also produced by long and exhausting watching over sick children, distress of mind, and indigestion.

In both the above forms, the pain is intermittent, seldom lasting long, but being of a sharp, piercing character like that of tic douloureux. The pain of Megrims usually begins at the inner angle of the eye, and extends towards the nose; the parts being red and sore, and the eye-ball tender. In Brow Ague, pain and great tenderness cover an entire half of the head, compared by the patient, sometimes, to "an opening and shutting of the skull." It begins with a creeping sensation over the scalp.

Rheumatic Headaches.—These generally affect persons who have been subject to rheumatism, and are often brought on by uncovering the head when sweating. The pain is usually in the brow, the temples, or the back of the head, and is dull and aching,—rather an intense soreness than a real pain; and the painful part is excessively tender upon pressure. The skin is moist, but not hotter than natural.

Treatment.—In considering the treatment, I will take up the same order in which I have spoken of the different forms of headache.

Plethoric Headaches.—Not much medicine should be taken for these, if it can be avoided. A diuretic (131) may be taken twice a day, and an occasional dose of gentle physic at night, followed by (7) in the morning. This will generally give great relief.

Meat should be taken but once a day, and the whole diet should be spare, the appetite never being fully satisfied. All spirituous drinks, including distilled and fermented, should be let alone, and coffee likewise.

Much exercise should be taken in the open air. The hair should be kept short, and the head elevated during sleep. Bleeding at the nose, when it occurs, must not be too suddenly stopped. Two drops of the tincture of aconite root with three of the fluid extract of gelsemium repeated once a half hour for three or four times will be found to be of great value in the treatment of this form of headache.

The hot-water bottle applied to that part of the spine between the head and shoulder blades will also give great relief.

Congestive Headaches.—The exercise, diet, mode of sleeping, etc., should be the same as in plethoric headaches. In this complaint, there is too much blood in the head, and it inclines to stagnate. The feet and hands are cold; and gloves and stockings of wool, and other bad conductors of heat from the body, must be worn.

Occasionally a little gentle physic (319) is desirable to induce the bowels to act every day. If there is great debility, iron (71), (74), (75), (320), will be required. The ice bag applied to the last six or eight inches of the spine will call the blood to the extremities. The aconite and gelsemium recipe as given above is also very useful.

Headache of Indigestion.—If the pain come immediately after a meal, and can be traced to something eaten, an emetic (2) may be taken, if the person be tolerably strong. If the pain come on some hours after eating, take rhubarb and magnesia (28), (14), or fluid magnesia. When the system is debilitated, take a warm draught (322) in the morning after a light breakfast, or twice a day, a bitter with an alkali (323). If the stomach be very irritable, bismuth, at meal times (324), (326). When it occurs after a debauch, take recipe (325).

Sick Headache.—When it results from food taken, a draught of warm chamomile tea, or a little weak brandy-and-water, will generally

give relief. If the sickness continue, soda and water, with a little ginger may do well, or a mustard poultice upon the stomach (165) may be required. As soon as it can be kept on the stomach, a dose of physic (326) must be taken; and if relief does not come after the operation of this, give a bitter and an aromatic (327). The patient must have perfect rest. If there be great lack of tone in the system, the mineral acids (328), (329) will be excellent.

The diet must be carefully regulated, as in plethoric and congestive headaches. Cocaine, one-eighth grain every fifteen minutes till the nausea stops, and then a dose of physic is an excellent method of treatment. Ten grains of ammenol (ammonol) every hour will stop the pain, and very often the same amount of phenacetine will accomplish the same result.

Bilious Headaches.—These are generally connected, more or less, with some affection of the liver.

During an attack, if the suffering be great, attended by nausea, give an emetic (2). In milder cases, give recipe (321). If there be costiveness, give recipe (330) at night, and (7) in the morning.

A few doses of podophyllin, leptandrin, etc. (34), (36), (39), to relieve the liver when the bile does not flow fast enough, will diminish the frequency and force of the attack. The fluid extract of dandelion, taken for some time, often does good service.

The diet should be light, and chiefly vegetable, and exercise in the open air must not be omitted. The daily sponge-bath, with friction, is excellent.

Nervous Headaches.—The first thing to be done is to relieve the pain, and this may generally be accomplished either by preparation (331), or (332), or (333), or (88), or (93), or two or three drops of tincture of nux vomica in a spoonful of water, taken three times a day. 351 will be found usually to be of most service.

In simple nervous headache, *diet* is of the greatest importance; in hysterical cases, *exercise*; in headaches from exhaustion, tonics (81), (79), (63), (73), (64), (61), (60).

Of the simple remedies found on the druggists' counter bromide of caffen in effervescent form is very efficacious.

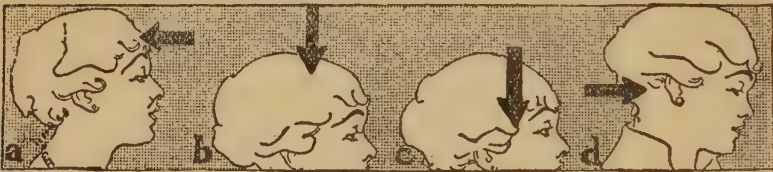
Rheumatic Headaches.—Take a light diet, with but little animal food. Wear warm clothing, and avoid exposure to wet feet and dampness generally, and go to a mild climate, if convenient.

When the local pain is great, apply hot fomentations, or a stimulating liniment (334), or a mustard poultice, to the back of the neck. In the beginning of the treatment, a little physic at night (335) is useful. 10 grs. potassium iodide, gradually increased, in water, is the best medicine.

Before closing this chapter on headaches, let me enter a respectful protest against the indiscriminate use of the thousand and one remedies advertised to cure headaches; for in a great majority of cases it

is merely a symptom of some other disease; for instance, Indigestion, Fever, Bright's Disease, Softening of the Brain, Diseased Liver, etc.; and the use of these remedies serves rather to increase than lessen the difficulty. Much has been written and much printed matter been given away by patent medicine venders vaunting their specific cures for headaches. These venders have grown in numbers of late, since the introduction into medicine of the coal-tar products, so that samples of headache cures may be found on one's doorsteps every little while. For the most part they are composed of what is known as acetanilide or antifebrin, because of its cheapness as compared with other coal-tar products. It is, however, the most harmful of them all, often causing blueness of the lips, fluttering of the heart, dizziness, faintness, etc. Of other similar products not so much danger may be expected, and yet no one ought to resort to these remedies without the consent and approval of the family physician. Eight grains of phenacetine for an adult, repeated in two to four hours, no doubt will cure more headaches of all descriptions than any other drug.

WHAT SOME HEADACHES OFTEN MEAN.



(a) Pain centred in the Forehead. Headache, Due to Eyestrain or Other Disorder in Some Distant Part of the Body. (b) Pain Top of Head is from Anæmia; Usually, Worse at Night or When the Patient Stands or Walks. (c) Pain Behind the Eyes Usually Associated with an Acute Attack of Rheumatism or Gout. (d) The Hyperæmic Headache, Following Excessive Use of Alcohol, Head Injuries and Certain Operations; Pain Centres in the Back of Neck.

Locomotor Ataxia.

Locomotor ataxia, also known as tabes, is an affection of the spinal cord, and although much more is known about the disease to-day than ever before, yet since 1847 it has had its present name.

The particular portion of the cord which controls the muscle sense is diseased, and it is not until very late in the trouble that losses of power are apparent. Men are more often afflicted than women, and most of the cases occur between the ages of thirty and forty-five.

The venereal disease of syphilis is responsible for about three fourths of all the cases, and mental worry or shock, blows on the spine, falls, overwork, exposure to cold or storms, excessive use of stimulants and tobacco, and sexual abuses, are the cause of the remainder.

Symptoms.—What are known as the three cardinal or chief symptoms of locomotor ataxia are *loss* of the patella tendon reflex, the reaction of the pupil of the eye, known as the Argyll Robertson pupil, and the swaying symptom known as the Romberg sign.

The first is the *absence* of the usual sharp jerk to the leg, which occurs in healthy persons when the tense tendon or cord just below

the knee-pan is sharply tapped, if the leg is at a right angle to the thigh. The second is absence of reaction of the pupil to *light*. In a healthy person the pupil dilates and contracts to both accommodation (or distance) and to light, while in this disease it only responds to the first.

The swaying symptom is noticed if a patient affected tries to stand with heels together and his eyes closed. While he will be unaffected if they are open, as soon as he closes them he sways violently and many times will fall. Other symptoms are pains in the calves of the legs and stomach, which shoot with lightning rapidity through these organs. There occur tingling and burning sensations about the head, neck, and extremities, shuffling gait, due to the loss of that sense which tells what position the feet are placed in, and requiring the eyes to be on the ground to prevent the patient from falling down. Disturbances of vision occur, and later a general weakness of the body from lack of sufficient exercise.

While a cure cannot be promised or expected, yet the disease may be arrested and controlled to a greater or less degree and its extension limited to slow progress.

Treatment.—Iodide of potash should always be tried in every case and under a physician's direction, as the time lost in experimenting can never be regained. Beginning with ten grains three times a day, rapidly increase to the point where the system is saturated, and then continue at this point for some time. Mercury, either by the mouth or rubbed into the skin, is a useful addition.

For the relief of pain, phenacetine or some other anodyne preparation will have to be given, though morphine should be avoided, unless absolutely necessary, owing to the liability, as in any chronic disease, of acquiring a habit.

Bromide of potash in doses of ten to thirty grains may be given to quiet the nerves.

Proper exercises, not carried to the point of fatigue, massage of the muscles, hot baths and electricity, all have their place and prove useful.

NEURASTHENIA. (*Nervous Prostration.*)

Neurasthenia is a condition of the nervous system which by reason of excessive fatigue has become so exhausted that the working powers of the body do not act in their natural manner.

What might cause a condition of Neurasthenia in a nervous person would not effect a slow-going, phlegmatic person. On the other hand a condition severe enough to cause excitability and ungovernable irritability of temper in the latter might be sufficient to cause insanity in the former case.

It is in the high-string, nervous society woman or the overburdened business man that this trouble is prevalent.

Symptoms.—A person afflicted with Neurasthenia may manifest it in its simpler forms by excessive nervousness, irritability and general crankiness. In aggravated form by melancholia, conditions with gloomy forebodings, a desire to be apart from friends, the afflicted has headaches, is unable to sleep, has dizzy attacks or vertigo, loss of memory. Cannot concentrate attention for any length of time, and later on muscular and other weaknesses are noticeable.

Treatment.—Complete rest, suitable food, proper stimulation and surroundings of improved hygienic and moral conditions. Massage, baths of different varieties, travel, light reading, release from trying cares, fresh air and change of occupation are necessary to effect a cure.

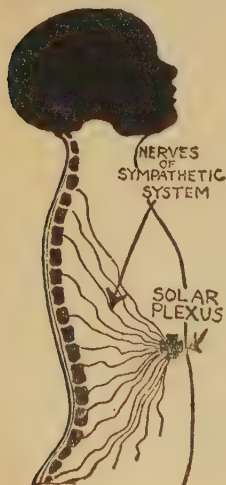
Neuritis.

Wounds, injuries, compression of the nerves, exposure to cold or wet, rheumatism and syphilis are among the principal causes of this affliction. Generally the seat of the trouble can be found by the presence of a spot or place sensitive to the touch, but is often present when there is pain in the nerve.

The most decided symptom is pain with tenderness along the nerve trunk; it is of an intense character, and is increased by pressure or motion. Sometimes muscular cramps occur, followed by impaired motion.

Treatment.—Neuritis shows the absence of mineral and phosphatic substances in the blood. Alkaline remedies are useful; such as hypophosphites. Phenacetine and sodium salicylate are also good.

For nerve pains apply oil of turpentine or Canadian balsam. Various other liniments, applied locally, are useful.



Sympathetic Nerves.

A Diagrammatic View of Human Body Showing How the Nerves of the Sympathetic System Connect the Spine with the Important Nerve Centre Known as the Solar Plexus That Is Situated Just Behind the Stomach. Every Other Part of the Body Is Linked with the Spine in Similar Fashion.

DISEASES of the NOSE and THROAT

DISEASES OF THE NOSE AND THROAT

(Also see Anatomy of Throat and Anatomy of Vocal Organs.)

Nasal Catarrh

I TAKE these diseases in the order of their location. Nasal Catarrh consists in inflammation, which begins behind and a little above the veil of the palate, and extends upward from thence into the nose. It is an exceedingly troublesome complaint, and afflicts great numbers.

When the inflammation has existed a long time, and ulceration has taken place, puriform matter is secreted, and drops down into the

throat, much to the discomfort of the patient. Indeed, this is one of the most distressing features of the complaint, as this matter often descends into the stomach in large quantities, causing frequent vomiting, and a general derangement of the health. Many times the sufferer can only breathe with the mouth open. Upon rising in the morning a great effort is required to clear the head and the extreme upper part of the throat. There is occasionally a feeling of pressure and tightness across the upper part of the nose; and the base

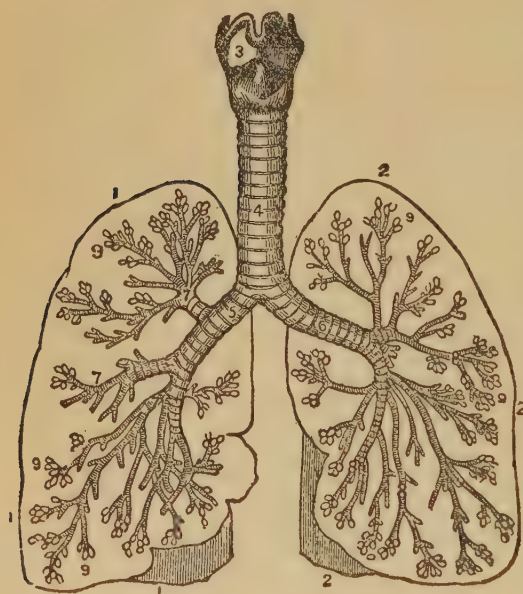


FIG. 86.

of the brain sometimes suffers in such a way as to induce headache, vertigo, and confusion. The smell is frequently destroyed, and sometimes the taste. The inflammation sometimes gets into the Eustachian tubes, the mouths of which are behind and a little above the veil of the palate, and extends up the lining membrane to the drum of the ear, causing pain or deafness, and occasionally both. In addition to this catalogue of evils, there is often added inflammation and elongation of the uvula or soft palate.

As the windpipe descends into the chest, it divides below the top of the breast-bone into two branches, one going into the right, the other into the left lung. These branches divide and subdivide very minutely, and send their ramifications into every part of the pulmonary tissue. Thus situated, Meckel has compared the windpipe to a hollow tree with the top turned downward,—the larynx and trachea representing the trunk, and the bronchial tubes, with their innumerable subdivisions, the branches and twigs. (Fig. 86.)

Inflammation of the Pharynx.—*Pharyngitis*.

THIS is an inflammation of the upper and back part of the throat, or all that part which can be *seen* when the mouth is stretched open. It causes a redness of the mucous membrane lining the part, which is deep in proportion to the intensity of the inflammation. This complaint is generally connected with the one I am about to describe; and since the treatment is the same the reader is referred to what next follows.

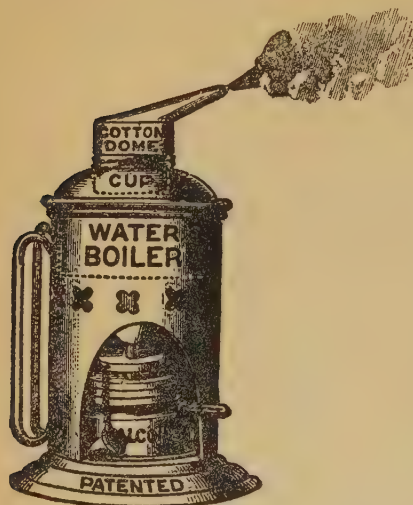
Inflammation of the Larynx.—*Laryngitis*.

Varieties.—Several types of laryngitis or inflammation of the larynx are recognizable,—*acute laryngitis*, in which the membranes alone are commonly involved; *edema of the larynx*, in which the deeper tissues become inflamed and infiltrated; *chronic laryngitis*, in which the various types of inflammatory processes assume a chronic nature; and what is called *symptomatic laryngitis*, when the nature of the trouble partakes of the characteristics of the microbes with which the locality has become infected. Rheumatism sometimes predisposes to an affection simulating laryngitis but differing from it in that the local symptoms are somewhat less active, though the pain and soreness on pressure and on swallowing is more severe than that experienced in the commoner forms. The voice is used with difficulty and there is shortness of breath in most cases. This form is very serious, especially in singers; the joints between the small bones of the throat may become involved when permanent hoarseness results. In some cases the laryngeal symptoms will be the only signs of rheumatism for months.

General Treatment.—The trachea is involved with the larynx; but it is rare for the former to be affected without the latter, so that it will suffice, in treating trachetis, to confine our efforts to inflammation of the larynx.

Diseases of the windpipe may be divided into (1) acute, (2) sub-acute and (3) chronic inflammations; (4) fibrinous secretions (see Membranous Croup and Diphtheria); (5) secretions of serous fluid; (6) spasms of the muscles (see Spasm of the Glottis); (7) nervous cough; (8) paralysis of the vocal cords; and (9) new growths (cancer, etc.). In all affections of the throat, however, there are character-

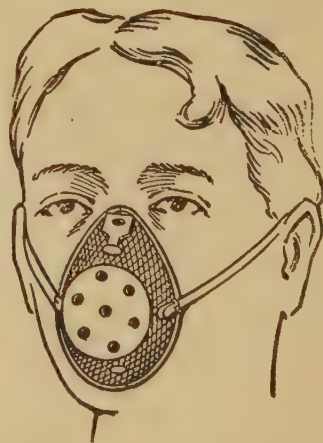
istics which are common to each, i.e., more or less complete loss of voice, dryness and redness of the membranes, more or less exudation of a thick, sticky material, and a dry rasping cough. In subacute and chronic conditions, otherwise known as "*sore throat*," the inflammation is of a "low" order, and the treatment is oftener local than general. With these exceptions, however, the relief desired must be obtained through general tonic measures, or those directed towards reduction of temperature if such there be; by means of proper local indication; and by restoring the "tone" of the mucous membranes.



Among the measures recommended for their general tonic effect upon the throat, those of hygiene are of the first importance. A change of climate or of occupation will sometimes effect a change when every medicine has failed. A sea-voyage or a resi-

dence in a clear dry climate is admirable for this purpose. A nutritious diet, outdoor life, invigorating exercise are also indicated. Among the drugs, iron, quinine and strychnine may be mentioned as well as a good cod-liver oil emulsion with hypophosphites.

It is, however, by means of local measures that the greatest results are to be looked for in the treatment of diseases of the throat. These may be applied either in the form of sprays by means of suitable atomizers; through the medium of steam as generated by any one of the well-known vaporizers or from an open pan of water which is kept at the boiling point; or better yet through the continual breathing of various healing oils from sponges or pledgets of cotton which have been saturated and placed in a mask and worn more or less constantly over the nose and mouth. Illustrations of one form of steam vaporizer, and also of a simple mask made of netting to be worn at night are given. Or one may charge the atmosphere of the room where he works or sleeps by setting free naturally, volatile substances of a chemical or vegetable nature. Instances of the latter



method are the employment of chloride of ammonia in aggravated cases of acute inflammation of the throat and windpipe, or the use of menthol in croup. In the former method a soup plate is placed on the floor of the room and three or four ounces of sulphuric acid are placed in it. In another plate nearby are poured two ounces of strong ammonia, and then about a tablespoonful of ordinary salt is sprinkled on the acid. In less than a minute the room is filled with dense fumes of ammonium chloride which are of great efficacy in those cases where a large amount of offensive secretion collects in the throat. In the second method mentioned, place a few crystals of menthol in a large iron kitchen spoon and heat over the gas or lamp until evaporated. Creosote produces good effects in whooping-cough, spasm of the glottis, and in chronic inflammations of the throat, if cloths wet with it are hung about the room. Turpentine and eucalyptol may be used in the same way in the place of creosote.

In cases where there is dryness of the throat it is better to set free the substances used by the aid of steam, allowing it to escape freely into the room or to enter a "bronchitis tent." Or the boiling water may be placed in a pitcher, medicated, and the head, pitcher and all enveloped in a blanket or towel. The "bronchitis tent" is made by lashing four broomsticks to the corners of the bed, and over this frame spreading two sheets pinned together in the middle, letting the side fall over the sides and ends of the bed, and making a canopy underneath which is introduced a tube from an "Arnold" or similar steam atomizer. From 2 to 5 drops or grains of any of the medicaments mentioned may be used in the water. Following are a few prescriptions for use with steam:

No. 1. Oil of pine	1 oz.	No. 2. Oil of eucalyptus	1 oz.
Oil of eucalyptus	1 oz.	Chloroform	$\frac{1}{2}$ oz.
Creosote	$\frac{1}{2}$ oz.	Creosote	$\frac{1}{2}$ oz.
Place 1 to 3 teaspoonsfuls in boiling water and inhale 3 or 4 times daily.		Use as in previous prescription or	
No. 3. Compound tinct. benzoin	1 oz.		
Menthol	10 grains		
Chloroform	1 oz.		
Make fresh each time used.			

After using steam inhalations the patient should not breathe the outdoor air for several hours.

For use with the face mask the following is valuable in cases attended with excessive cough:

Chloroform $\frac{1}{2}$ oz., Creosote $\frac{1}{2}$ oz., Menthol 10 grains. Dose 10 drops in the inhaler every 3 hours. Any one of these ingredients may also be used alone. Sometimes when there is a large amount of thick, sticky mucous secretion 10 drops of tincture of iodine may be used to liquefy the secretion and stimulate the membranes.

There are many vaporizers or nebulizers on the market at the present time in which by means of compressed air the medicament is forced against the sides of the inhaler and broken up into a fine cloud or vapor. An oily fluid is usually employed in which to dissolve the medicine. The following will be found useful in acute cases of inflammation:

Menthol	20 grains
Camphor	10 grains
Liquid petroleum	1 oz.

Inhale the vapor several times daily from an atomizer.

An unusually good sedative to the membranes of the throat is made thus:

Chloretone	gr. ii
Menthol	gr. xx
Camphor	gr. xx
Oil of cinnamon	2 drops
Liquid petroleum	1 oz.

Use in the vaporizer every 3 or 4 hours for a period of ten minutes.

If the inflammation is very severe or chronic the following may be substituted:

Oil of sassafras	3 drops
Oil of sandalwood	5 drops
Liquid petroleum	1 oz.

Use every 3 hours. In such small doses sandalwood oil is sedative. If a stimulating action is desired the quantity should be increased to 30 drops. An even stronger formula in obstinate cases will be found in Oil of eucalyptus 1 teaspoonful
Oil of tar 2 teaspoonfuls
Liquid petroleum 1 oz.
Use every three hours.

Paralysis of the laryngeal muscles or aphonia, and new growths when appearing in the throat are amenable to the same treatment as when the affections occur elsewhere in the body.

Catarrhal Inflammation of the Larynx.—Acute Laryngitis.

In the acute form of what is commonly called "sore throat" we have more or less feverishness, huskiness or suppression of the voice, painful swallowing and more or less difficulty in respiration.

The disease is usually brought on by atmospheric changes; cold draughts of air either inspired or striking exposed parts of the body; cold, wet feet; inhalation of irritating substances like dust, gas, smoke, etc.; prolonged efforts at public speaking; in children violent fits of crying.

The attack begins rather abruptly, with a feeling of dryness, rawness, and tickling or scratching in the throat, together with the sensation of the presence of a foreign body in the throat, hoarseness and a persistent tendency to clear the throat. The larynx is tender on pressure.

A hard dry cough is usually attendant. The first day or two the cough is not attended with very much secretion which, however, be-

comes later more profuse and slightly streaked with blood. The voice at first husky, soon becomes altogether lost. The respiration is very slightly if at all increased in adults, though children are more sensitive, being kept for the most part more indoors and sheltered. With these the flushed face, hot skin, coated tongue, dry cough and "scratchy," "lumpy" throat should render the case immediately suspicious.

The disease lasts, usually, about a week; or if very severe, or if the patient is not able to give himself proper attention, it may be prolonged to three or four weeks.

Treatment.—There is never any danger but what the throat will clear up if properly treated, in every case of "simple" sore throat. Confinement to a room of uniform temperature, and absolute rest for the voice is necessary. The air of the room should be kept moist with steam vapor—medicated or not, though the former is preferable. At the very beginning the feet should be placed in a hot mustard bath and a large dose of epsom salts administered. Prompt action on the skin will often abort the severity of an attack. For this purpose aspirin and Dover's powder in 3 to 5 grain doses every three or four hours is beneficial and comforting, relieving both the pain and reducing the temperature by increasing the perspiration. In rheumatic subjects aspirin works well alone or in combination with salicylic acid. In malarial districts the addition of two grains of quinine to the dose is advantageous. A cold compress, covered with oiled silk to the larynx is very grateful and will greatly aid in relieving the congestion; or an ice collar may be used if more convenient. The continual use of hot applications to the throat while soothing and gratifying to the patient apparently causes increased congestion in some cases. A pitcher of boiling water with a cornucopia of paper placed over it makes an inhaler which is at once simple and efficient. One of the best formulas to use in this way as a medicated vapor is: menthol, grs. ii; tinct. benzoin comp. $\frac{1}{2}$ and laudanum of each one-half ounce; mix and add one teaspoonful to a pint of boiling water, and inhale for five to ten minutes at a time every hour. The oils of eucalyptus, turpentine, pine or juniper berries may be used in the same way in the proportions of one-half ounce to the pint. Some of the various lozenges containing menthol, camphor or ammonium chloride are very acceptable to relieve the "tickle."

Local Treatment.—The upper passages should always be cleaned with a spray or an irrigation of warm normal (*i.e.*, 2 per cent) salt solution. This is to prevent extension of the trouble into the head and nose at the same time cleansing the passages of any source of irritation or contagion. Solutions of Dobell's, Seiler's, or the compound antiseptic powder of the U. S. P. may be similarly used.

Inhalations of menthol and camphor dissolved in albolene are valuable and soothing especially in the "dry" stages of the attack. To use these effectually the tip of the tongue should be wrapped with a piece

of gauze, extended and held by one hand while the nostrils are pinched with the other. The patient now inhales and exhales through the mouth, bringing the vapor into contact with every part of the throat. Strong applications or sprays to the larynx and throat should never be used.

In every case of catarrhal laryngitis it is important to maintain and preserve the general good condition of the patient. Reconstructives and nerve tonics, such as strychnine or nux vomica with quinine and iron, are indicated. Alcohol and tobacco should be tabooed during an attack. Frequently a prolonged rest for the voice and throat or a change to a warmer drier climate is necessary.

The Chronic Form of Catarrhal Laryngitis— Chronic Laryngitis.

THIS condition is not necessarily subsequent to, or resultant from, an acute case, although neglect of the latter form may easily run into the first. It is more often the accompaniment of various forms of systemic disease and must be studied and treated accordingly. In one form there may exist little wart-like excrescences or nodes called "singer's nodes." In these cases a six months rest is imperative.

If the condition is caused by nasal stricture or by areas of swollen or dried tissue these must receive appropriate attention from the surgeon.

Attacks of indigestion, gout or rheumatism must be properly and systematically treated.

Internal Treatment.—This condition is of itself not easily amenable to treatment. Iodide of potash in ten to fifteen grain doses three times daily after meals may be given to assist in the absorption and resolution of the thickened membranes; but this is about the limit of our endeavors. There is no specific for the trouble. The use of alcohol and tobacco should be forbidden.

Local Treatment.—Laryngeal sprays similar to those noted above for use in acute laryngitis may be used and aid in giving temporary relief and comfort to the patient. They are of no curative value however. The same is true of oil sprays. So that the treatment of a case of chronic laryngitis resolves itself into a matter of choosing the very best specialist available, who will make local applications of suitable kind and strength to insure results. This it is impossible to leave to inexperienced hands. Laryngeal applications should be made with great care with suitable instruments; all excess of medication should be removed after treatment.

Above all one should eliminate from use each and every one of the vast list of proprietary preparations advertised for these conditions and which at best are deleterious to the delicate membranes of the throat, and in many cases positively destructive.

Dry Inflammation of the Larynx—Laryngitis Sicca.

THIS is a chronic condition of the throat, in which the mucous membranes are dried and shrunken. It generally follows a similar condition in the upper air passages. In fact the whole respiratory canal feels hot, dry and raw; the least increase in the activity of these parts, or any sudden change of climate or atmospheric irritation, will bring on a train of almost unbearable symptoms.

Treatment.—Numerous remedies have been advocated, none of much value unless the entire respiratory passage is treated simultaneously. Internally, pilocarpin in $\frac{1}{10}$ grain doses three times daily, by aiding in the general glandular activity of the body, may be of value. Phosphorus (gr. $\frac{1}{100}$) in oil or iodide of potash are also in use. Soothing inhalations of menthol or camphor in albolene are grateful but not curative. In a similar way inhalations of benzoinated steam, applications of thymol (2 to 5 per cent) in oil, and zinc sulphite (1 to 3 per cent) have been advocated.

Of the local applications 5 to 10 per cent oil of tar or argyrol 50 per cent are most efficient when employed by skilled hands.

Some surgeons advocate deep injections into the tissues of the throat of menthol, guaiacol and camphor in olive oil, but this should be done only by a trained specialist.

Symptomatic Laryngitis.

THIS form occurs in the course of many diseases and involves as a rule the deeper tissues. The symptoms vary widely in intensity, ranging from those of simple catarrh to the most severe case of edema calling for immediate surgical interference.

1. *Measles* is usually attended by extension to the throat of the same inflammatory process seen upon the surface, and resolution or healing usually progresses without complication. Very rarely edema or ulceration occurs.

2. *Variola and Varicella*.—The appearances of laryngeal complication in these diseases are numerous, and vary in intensity with that of the general disorder. The symptoms are those of croup; but the characteristics of the disease are very clear, there being present small pustules and ulcerations on the cores and membranes.

3. *Scarlet fever* is often attended by involvement of the larynx; in the vast majority of cases, however, there is little danger and the trouble clears up along with the general malady.

4. *Erysipelas*.—There is a form of acute laryngitis closely associated with erysipelas if not actually the disease itself appearing locally. It is a dangerous form, being accompanied by edema, high fever, great hoarseness and difficulty of breathing from the start.

5. *Typhoid Fever*.—Signs of laryngitis may appear in the beginning of this disease, when it is very common and not at all dangerous; or as

late as two months subsequent to or during recovery, when it is nearly always fatal, so rapidly do the symptoms appear.

6. *Pertussis*.—In whooping cough the laryngeal symptoms are marked, but they are not attended as in other diseases by ulcerative processes. The severe cough causes congestion and sometimes slight hemorrhage. The most annoying feature of trouble in this connection is that the congestion may persist indefinitely and the patient be subject to fits of coughing on any provocation.

Treatment.—The treatment of symptomatic laryngitis does not differ any from that of the acute form. As a rule the laryngeal complications in infectious diseases are slight, but the possibility of complications in this direction must always be borne in mind, owing to the fact that they may become so rapidly fatal when untreated.

Tuberculosis of the Larynx.

A POPULAR belief exists among the laity that catarrhal affections of the nose, throat and larynx lead to tuberculosis. It is exceedingly difficult to deny or affirm this assertion by scientific measures.

Certain it is that any part of the respiratory canal may become suitable breeding ground for the tubercles if there is any systemic predisposition to consumption; and this is just as true of the larynx as of the lungs themselves.

It is also true that long-standing cases of tuberculosis of the larynx may lead to a general infection from the disease.

But this is not proving, or even implying, that a catarrhal condition, as such and of itself, will eventually, if neglected, bring on tuberculosis.

On the contrary it is rare to find, in any part of the body, tuberculosis following catarrh. To have true consumption the tubercles must be isolated—there is no tuberculosis without the germ—no matter how closely the condition may resemble this disease or how suspicious the case may be. Catarrhal surfaces are not good soil for the germs of consumption, as a rule.

Symptoms.—The signs of a tubercular larynx are plain enough even to the ordinary observer. In addition to the general symptoms of inflammation of the larynx we have a more pronounced huskiness,—in some cases amounting to a more or less permanent loss of voice; greater dryness and in the more advanced cases an exudation or throwing off of material which is more putrid than ordinary catarrh, resembling more the contents of an abscess, which in truth it is.

These conditions, together with a noticeable falling off in weight, hectic fever, and a general feeling of malaise should lead at once to a thorough examination at the hands of the best specialist obtainable and his advice rigidly adhered to.

Treatment.—The treatment of tuberculosis of the larynx resolves itself into prophylactic, hygienic, climatic, specific, symptomatic, local, surgical and general.

The prophylactic treatment of tuberculosis of the larynx, as in similar trouble elsewhere in the body, involves not only fighting the infection but in combating the large factor of predisposition or heredity. Established rules as to fresh air, sunlight, forced feeding, and carefully directed exercise apply with double value in prophylaxis. Those who bear the ear-marks of a tuberculosis tendency, or who may be exposed to the disease at home or at work should receive timely advice as to occupation, habits of life, diet, and general hygiene. It should be borne in mind in this connection, that the greatest obstacle to be overcome in endeavors along prophylactic lines is the patient *himself*, who is more likely than not to consider "rules" as irksome. But once the diagnosis is made by a competent physician there must be no let up in painstaking care by the one under exposure.

The hygienic treatment of tuberculosis of the larynx embraces proper clothing, cleanliness, easily digested and nourishing food, outdoor life and properly ventilated or open-air sleeping rooms. Air loaded with coal gas or with poisonous organic substances such as is found in cheap theaters and halls, and the more or less immoderate use of tobacco, liquors, ice, etc., is not only irritating but injurious. The use of the voice should be moderated as far as possible; rest plays as important a part in laryngeal tuberculosis as in involvement of the lungs.

The influence of climate is well recognized. In local affections involving general or advanced pulmonary tuberculosis it is far better to remain at home than to seek relief in some indefinite place, especially if financial resources are limited. The inflammatory conditions of the larynx do better in a warm moist climate; but since the lung trouble does better in a high, dry warm climate it is advisable when possible to seek sanatorium treatment in Arizona, New Mexico and the higher parts of Southern California. The treatment of the patient should be at all times in the hands of a competent physician. In the earlier stages of the affection the best results are obtained at an altitude of 6000 feet.

Many cases will improve in a lower altitude, 3000 feet or less, though remarkable cures are reported from Silver City, New Mexico. Here though the altitude is 6000 feet, the nights are cool and the days warm. An ocean trip to the Riviera or Egypt is of great benefit to those who suffer principally from local infection without much lung involvement.

Numerous *specifics* have been advocated from time to time for the cure of laryngeal tuberculosis, all of which have in part at least some merit. It should be remembered too that failure from their use is due in great measure to the fact that in laryngeal forms in particular there is almost always an attendant pulmonary involvement of more or less importance. Among the specifics may be mentioned tuberculin, antitoxin, serum, vaccines, iodine, chloride of gold and soda, creosote, formalin, nucelin, oil of cloves, the X-ray and radium. The most useful of these is tuberculin. If the individual case is in-

telligently studied and the dose properly regulated, great improvement and even cure may result in a large proportion of cases. This is true in those cases that have gone on to ulceration. When a reaction occurs or the case is complicated with severe anemia valuable aid may be obtained by the use, hyperdermically, of green citrate of iron or sodium arsenate. By this method the stomach and digestive apparatus is spared. The use of phosphorus (gr. $\frac{1}{100}$) in a ten minium capsule of olive oil is of benefit in the more chronic cases. It should be given after meals and quickly discontinued if the stomach shows signs of irritation.

Remedies are also necessary to allay cough, temperature, pain, diarrhoea and mental worry. For the first, third and fourth symptoms heroin (gr. $\frac{1}{12}$) or codeine (gr. $\frac{1}{8}$) are efficient but should not be used unless absolutely necessary. The craving for depressing drugs should be denied in cases which offer a hope of cure as the resistance of the patient may be undermined, and digestion and elimination interfered with.

The local treatment consists of inhalations of medicated vapors or powders and the application of drugs to the affected parts. Before this treatment is administered a spray of Dobell's or similar solution is used to remove the secretions from the larynx. Applications of formalin in gradually increasing strength is probably the most efficient of the many drugs used against the tubercles. This is prepared freshly from a 40 per cent solution, using at first a $\frac{1}{2}$ per cent strength, increasing as tolerance is established to 10 per cent, with 2 per cent cocaine if the throat is over-sensitive. Applications of lactic acid (20 per cent) are highly recommended by many laryngologists, while insufflations of iodoform are in vogue among the older practitioners. Orthoform and anesthesin are used for the relief of pain. Argyrol (20 per cent) may be used when too much irritation is set up by the formalin. For the relief of pain and cough injections into the tissues of the larynx of guaiacol (2 per cent) menthol and camphor (each gr. ii) in olive oil are recommended. The X-ray is attended by dangerous reactions.

Surgical treatment may be necessary when the above measures are insufficient to allay or modify the ravages of the disease, and those lesions affecting the epiglottis removed. Curetting is of value only when the tubercular deposits are of comparatively small area.

When swallowing becomes very painful a spray of 10 per cent cocaine before meals is justifiable or the head may be hung over the edge of the bed and liquid food sucked up through a straw from a glass on the floor, the patient feeding like a horse.

Removal of the larynx, or tracheotomy is hardly ever of value.

Constitutional treatment is of value in the earlier stages of the disease, in the form of cod-liver oil, malt, hypophosphites and creosote.

As a last resort, in the advanced ulcerative stages occasional small doses of morphine hypodermically must be administered.

Hair Lip.

THIS common deformity is due to non-union of the middle nasal cartilage with the upper jaw bone. There may be (a) a mere notch in the red edge of the lip; (b) a cleft through the soft portion of the upper lip only; (c) a cleft through the lip and nostril and accompanied by cleft palate; (d) double hare-lip with a floating piece of bone and a cleft palate, a variety witnessed in one-tenth of all cases. In the latter case the pieces of bone usually project and are either covered by skin or connected with the nasal septum, projecting sometimes as far as the tip of the nose.

When the cleft extends into the nose there is always a simultaneous defect involving separation of the middle and lateral incisor teeth.

Other deformities of the face, due to defect in development, are sometimes present: fissure of the cheek, eyelid, etc. Single hare-lip occurs most frequently on the left side. It is often traceable to heredity.

Treatment.—Operative procedures are alone of value, the age at which these should be resorted to giving rise to considerable discussion. The resisting powers of the child should first be determined; while one may easily stand the operation a few weeks after birth, another will die from shock.

The best age for operation for hare-lip depends on the condition of the child and the character of the deformity. Should only the soft parts be involved operation should be done at once. In simpler cases the earlier the operation the better.

Should the child be weakly, or the fissure be double and extend through the hard parts, then the operation ought to be postponed some weeks or even months. From six weeks to three months is probably the proper time for operating.

Before operating it is very important to know that the child has not been exposed to any contagious fevers, like measles, or scarlatina. This is one cause of failure. Another is the continued crying of the child, and also the too-early removal of the stitches; sutures should not be removed too soon, being left in from six to ten days. Sepsis is the greatest cause of failure.

After the operation, if there is difficulty in breathing through the nostrils, rubber tubes introduced will be found a great aid and prevent collapse of the nostrils. The parts should be kept clean with aseptic washes before the operation.

Hare-lip babies are not necessarily feeble at birth, and by proper feeding can be kept up to the normal standard.



The opposite diagram shows the exact mechanism of a sneeze. When pollen or any other irritating body enters the nostrils it lodges in the Schneiderian membrane and irritates the nasal nerve, A, the sensation follows the fifth nerve, B, to Meckel's ganglion, C, whence it reaches the sympathetic nerve system, D. It passes along D and is carried by the phrenic nerve E, controlling the diaphragm. Under the irritant nerve impulse there is a spasm of the diaphragm which forces a violent expiration of air from the lungs G, up through the trachea, H, out of the mouth and nose I, producing what we call the sneeze.

Elongation of the Uvula.

THE uvula is the small teat-like or pendulous organ which hangs down from the palatine arch, just over the root of the tongue. It is very apt to get inflamed, and its parts becoming relaxed, it stretches out lengthwise, so that its lower extremity sometimes rests upon the tongue. (Fig. 88.) When this happens, it flaps about, backward and forward, and to the right and left, —touching the throat at various points, and by the tickling sensation produced, exciting a most incessant, uncontrollable, and racking cough. Some of the most distressing coughs I have ever heard have been produced and kept up by this cause alone. Many a fatal consumption has begun in this way. When long inflamed, it often gets much out of shape, being sometimes bent nearly double.

Treatment.—In some cases, the uvula, thus elongated, may be reduced back to its natural size, by an astringent gargle, composed of an infusion of white-oak bark, with a little alum dis-

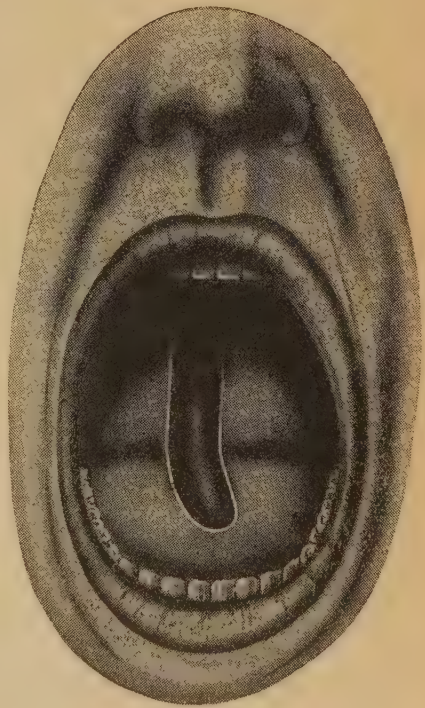


FIG. 88

solved in it (232); but it will generally stretch out again and again, upon the appearance of any fresh cold, and, therefore, the only certain cure is to cut it off.

To do this, take hold of it with a pair of common forceps, and having stretched it down a little, clip it off above the forceps, with a pair of curved scissors. Nearly the whole of it should generally be removed. To take off a part only leaves a stump, which is often more objectionable than the whole organ. Its removal never injures the speech in the least. In many cases of nasal catarrh, this organ is a sort of diseased centre, from which inflammatory action spreads upward into the nasal cavities, and no medicine or power on earth can effect a cure until this offending member is snipped off.

Acute Inflammation of the Tonsils.—*Tonsilitis*.

THE tonsils are chiefly a collection or mass of small mucous follicles or glands. They secrete a portion of the fluid which keeps the throat moist.

There is a class of persons who suffer about every winter, sometimes oftener, with an attack of acute inflammation of these glands, which causes great suffering for several days. The trouble usually is ushered in by high fever, backache, headache and often by chills; the temperature often reaches to 103° and 104° F.; swallowing is difficult on account of the swollen glands, while pain in the ear is not infrequent. The tonsils are at first swollen, reddened and inflamed; later a whitish patch of secretion forms on the surface of the gland and is distinguished from that of diphtheria by being whiter and less tenacious; if removed, the underlying surface does not bleed as in the case of diphtheria. It is, however, very difficult, at times, to distinguish between the two diseases at first.

Another form of Tonsilitis occurs without patches, and is in reality an inflammation of the substance of the gland itself. This variety, often called *Quinsy*, goes on developing into an abscess, the anterior pillar of the fauces becomes intensely red, swollen and shiny.

Treatment.—For the more common variety some antipyretic to reduce the fever and allay the intense aching of the head and bones is properly indicated. For this purpose 10 grains of Phenacetine (for an adult), repeated every two to four hours according to the effect produced, is quite efficacious. Ammonol in same dose may also be used. Some simple astringent and soothing gargle will next be found to render signal relief. Tannin, 30 gr., strong Carbolic Acid (95%), 30 drops, Glycerin, 1 oz., and peppermint water, 3 oz., is an admirable gargle for the average case: this should be used hourly.

Equal parts of Glycerin, Alcohol and Water makes a very soothing gargle, while equal parts of Peroxide of Hydrogen and Water is preferred by many. The diet should be limited in amount and consist only of liquids.

Tincture of aconite in 1 or 2 drop doses together with half teaspoonful of sweet spirits of nitre repeated every hour will help to allay the fever and congestion of the throat, and goes far to prevent pus formation which is usually spoken of as Quinsy sore throat. This abscess, if formed, may be evacuated by the physician, who alone should attempt it, as the region is a dangerous one, being close to the carotid artery and jugular vein, which would cause instant death if cut.

It has been found that Tonsilitis is apt to be recurrent and that he who has suffered once is very prone to have one or more attacks annually thereafter. This class requires constitutional treatment in the intervals as outlined below.

These inflammations are likewise found to be an expression oftentimes of rheumatism, and need corresponding treatment. But the only *cure* is to be found by cutting off the tonsils, after the inflammation has subsided. This will put an end to the attacks at once.

Tonsils which are subject to these periodical attacks of acute inflammation are always more difficult than others to operate upon, as they are almost invariably bound down very tight to the throat and cannot be raised up for convenient excision.

Chronic Inflammation of the Tonsils.

In many of the follicular diseases of the throat, these glands are affected by a chronic inflammation, and are found enlarged, and sometimes very much hardened. In such cases they secrete a thin, unhealthy, irritating fluid, which is spread over the throat, increasing and perpetuating its disease. Much of this secretion finds its way into the stomach, and thence into the circulation.

In the throats of many young persons and children, these glands are permanently so large as nearly to fill the fauces. The respiration of many children thus afflicted is difficult, and when asleep they can only breathe with the mouth open. The defective breathing of such children often occasions contractions of the chest, and thus lays the foundation for consumption. From these diseased parts, the inflammation often spreads upwards, into the posterior nares, and many times enters the Eustachian tubes, causing deafness or pain in the ears. Such children often breathe as though they had a bad cold in the head. Their health and safety require an immediate attention to this state of things.

Chronic inflammation of the tonsil, likewise the recurrent acute form, may be dependent on poor blood or rheumatism. Those causes are met by blood-building medicines like Syrup of the Iodide of Iron in 10-drop doses three times daily, cod liver oil, and by some one of the many preparations of iron, arsenic, and strychnia combinations. It is found that generally the excision of the tonsil may be averted by visiting the surgeon, who will hunt out the little crypts or holes with which the gland is studded, and by gently cutting the narrow

bridges which separate these holes, destroy these cavities. These little holes retain small particles of food and decomposed secretion, which after a while, if allowed to remain, set up a follicular tonsillitis. The size of the gland is thus greatly diminished and the little secreting follicle destroyed. Many a little sufferer can thus be spared the harsher method of excision, and bear with good grace, especially if cocaine be used, what otherwise might be a painful and bloody operation. But, as has been said, excision in many cases must be resorted to.

Curability of Throat Diseases.—I have dwelt somewhat upon the preceding forms of throat disease, because they prevail to a fearful extent, and are, in thousands of cases, but the first stages of fatal disease of the lungs.

If not connected with lung disease in the *beginning*, my experience in treating them enables me to say, emphatically, they are generally *curable*.

But patients often put the question to me—"If cured, will I ever have the complaint again?" My answer is—"Unless I can plant in your constitution a better protection than your Maker put there at your creation, you will of course be *liable* to a second attack." But then, where the lungs have been entirely free from disease, I have never yet seen a case of simple throat complaint relapse and become *dangerous* after proper treatment with the syringes. Let not those, therefore, who have been benefited, but not entirely cured by this treatment, undervalue what has been done for them. Even in such cases, the advantage derived to them amounts to just the value they attach to *the continuance of life*.

Dangers of Delay.—In closing these remarks, let me warn the reader against the dangers of delay. Many of those who finally seek medical attendance in these complaints, first try all nostrums, and tamper with their disease till the case is either critical or hopeless. Too many wait till they are near enough to the engulfing whirlpool to hear it roar, before they seek in any practicable way to escape its dangers.

Many persons neglect a slight inflammation of the pharynx, which might have been cured in a few days, but which, from long neglect, has gradually crept down the windpipe, spread over the widely distributed mucous lining of the bronchial tubes, and thus become curable only in a partial degree, and after long and tedious treatment. Hundreds of persons are now suffering from slight attacks of this sort, who might be rid of the affliction in a week or a fortnight, but who will either carelessly give it no attention at all, or resort to useless nostrums, until it has run through its primary stages and invaded the constitution, and will finally die of some of the forms of pulmonary disease.

A Cold.—Influenza.

A SLIGHT attack of the disease about to be described, affecting only here and there a person, and lasting only for a few days, is called a *cold*. When it affects a large part of the community at the same time, lasting many days, or even weeks, it is then an epidemic, and passes under the name of *influenza*. In this latter form, it sometimes spreads over a whole country, and has at times, as in 1832 and 1894, extended to nearly the whole civilized world. It often shows marked severity in its progress, and leaves serious results behind.

Symptoms.—A tingling, with dryness, and a sense of fulness in the mucous membrane of the nose, are among the first indications of an attack of this complaint. Sneezing is a common symptom. Soon pain is felt in the forehead, and breathing through the nose becomes difficult. The eyes are red and watery, the throat is sore; there is a dry cough, hoarseness, thirst, general lassitude, chills, and a desire to get near the fire. The mucous membrane of the nose, throat, windpipe, and breathing-tubes is inflamed, red, swollen, and sometimes painful.

In a short time, water begins to run from the nose and eyes, and the cough becomes a little more moist. There is also a slight discharge from the throat and tubes, which gradually increases, and, at length, as the disease declines, and becomes less acute, the expectoration is thick and yellow.

Aching of the back and limbs, thirst, loss of appetite, flashes of heat, and chills whenever the patient is exposed to air a little cooler than he is accustomed to, are almost constant attendants upon the disease.

Causes.—It is not always easy to say what the causes of this complaint are. Frequently, it can be traced to an improper exposure to cold or dampness; but in a great majority of cases, especially when it takes the form of influenza, the causes are not obvious. They probably exist in some peculiar states of the atmosphere, and in a depression of the nervous system.

The influence upon disease of the different degrees of density in the air which surrounds us, and of other circumstances affecting it, have not been much studied. Some valuable facts will be drawn from this source before many years. The putting upon the body, or taking from it, several tons of pressure every time the barometer rises or falls, must have, of itself, no small influence upon its health. The comparatively new science of Physical Geography, by spreading before us its interesting facts in regard to temperature, storms, atmospheric currents, etc., is opening the way for the physician to learn a great deal more about the causes of disease than he now knows.

Treatment.—In mild cases, only the most simple treatment is required,—such as remaining in the house for a few days, soaking the

feet in warm water, taking a gentle sweat, drinking warm infusions of flax-seed, mullein, slippery elm, or warm lemonade, and taking only a spare vegetable diet. If the bowels be costive, some gentle physic (34), (41) may be used. A laxative drink (132) will likewise be useful.

At the outset, especially when the nose runs water, a small dose of atropia, $\frac{1}{200}$ grain, taken every two hours till the throat is dry, will entirely arrest the disease at this point. The coryza pill found at the druggists' is a more valuable remedy still.

When the attack is more severe, sweating must be induced by decisive measures. This may be affected by the spirit vapor-bath, or by putting the patient in bed, putting bottles of hot water to the feet and sides, and administering warm drinks, and the compound tincture of Virginia snakeroot. Five drops every hour of the tincture of veratrum viride will often cause very free perspiration, and will reduce the inflammation upon the mucous surface.

An emetic is sometimes very useful. To produce vomiting, use the powder of ipecac, ten to twenty grains, or the compound tincture of lobelia.

It soothes the inflamed mucous surfaces very much to inhale the vapor from half a pint of hot water, with five drops of tincture of veratrum viride, or the same amount of the tincture of aconite root.

If the cough is severe, use the preparations recommended under bronchitis and consumption.

In the latter stages of the disease, if there be debility,—as there generally is,—quinia, iron, nux vomica, etc. (75), should be taken; or, to support the nervous system, the extracts of scullcap, and bone-set, and the sulphate of quinia (81) will be found useful. At this stage of the complaint, the diet should be more liberal and nourishing.

The patient should not venture into the open air until the unpleasant sense of chilliness, peculiar to the disease, ceases to be produced by exposure.

La Grippe.

THIS is a variety of influenza with which the world has become well acquainted within the last few years. Its history is interesting and its symptoms and results are severe and annoying. It is one of the most severe forms of catarrhal disease of the nose or throat with which we are acquainted. It owes its origin to a germ which found its birth in the filth and pollution of eastern Europe, and has visited the globe with terrible ravages on several occasions since the Middle Ages. It spreads by travelling the most frequented paths of commerce, and attacks those in a depressed state of health. The varieties of la grippe are as numerous as that of any other disease. The *catarrhal* form is much like that of ordinary head influenza, only it is more severe and prostrating; the *bronchial* assumes the influenza type, at first, but soon attacks the lungs and sets up a severe, prolonged and

harassing bronchitis; the *intestinal* variety, besides producing the general symptoms of malaise, fever, cough, severe aches and pains, gives rise to a diarrhœa which lasts many days and is very debilitating; the most common variety, however, is the *rheumatic*, which is ushered in by chills, fever, muscular pains, coryza, cough and general rheumatic pains. The characteristic feature of all of these forms is the great prostration which accompanies these symptoms and the obstinacy with which it clings to the patient.

The sequelæ of the disease, though much exaggerated, are numerous. The aged are often left infirm with heart weakness, the young with lessened resistance to disease, and the middle-aged with chronic coughs.

Many an undiscovered disease has passed unnoticed under the disguise of "la grippe." It has no doubt served as a broad mantle to cover our ignorance of real disease and been made an easy refuge for the complaining; still its affects at times cannot be over-estimated and death has not infrequently resulted.

Treatment.—The onset is to be met with large doses of quinine, say 10 grains on retiring, by phenacetine and salol, 10 grains each, taken with some hot lemonade on retiring. This latter may be repeated every three hours. The coryza is checked by small repeated doses of belladonna, camphor and quinine, as found in the coryza tablets bought at the druggist's—one taken every two hours till the throat is dry, then once in four to eight hours. The debility is to be met by tonics.

Acute Inflammation of the Epiglottis.

THIS is the disease by which our country lost its most loved and distinguished citizen, George Washington. This complaint was not understood at the time of his death,—the intelligent physicians who attended him supposing it to be inflammation of the windpipe. From their very clear description of the symptoms, we now know it to have been an acute inflammation of the epiglottis and glottis.

From the rapid inflammation of the epiglottis, water is effused into this cartilage, so as to puff it up, and prevent it from shutting down in the act of swallowing. The lips of the glottis are swollen from the same cause, and brought so near to each other that air passes through to the lungs with great difficulty, and unless relief is soon obtained, the patient is strangled.

Symptoms.—The disease begins with a severe chill, accompanied with some pain, and a sense of stricture or tightness in the upper and fore part of the throat. There is cough, with difficult and sometimes painful swallowing. These symptoms are soon followed by quick and laborious breathing. Speaking aloud is from the first difficult, and soon becomes impossible. As the complaint runs its rapid course, the breathing grows more difficult, and death soon results from complete strangulation.

Treatment.—The steam inhaler should be used at once to loosen up the exudation and soothe the membranes. A good solution to use would be No. 111 leaving out the honey; or compound tincture of benzoin one half ounce to the inhaler full of hot water.

While this local treatment is being employed, liberal doses, from five to twenty drops, of tincture of *veratrum viride* should be given every hour, watching the effect, and discontinuing when the pulse sinks too low.

Hot fomentations applied externally, and filling the room with steam, as recommended in cases of croup, would be useful.

Mumps.—*Parotitis.*

This disease appears most often among children; but as it is not confined to them, I have not placed it among their complaints.

Symptoms.—It begins with soreness and stiffness in the side of the neck. Soon a swelling of the parotid gland takes place, which is painful, and continues to increase for four or five days, sometimes becoming very large, and making it difficult to swallow, or open the mouth to receive food. After the fourth or fifth day the swelling subsides, and disappears in from seven to ten days.

Both glands generally swell about the same time, but sometimes the swelling appears in one only after it has subsided in the other, and occasionally the swelling is wholly confined to one side.

When the swelling is great, there is heat, and sometimes fever, with dry skin, quick pulse, furred tongue, constipated bowels, and scanty and high-colored urine.

The affection is sometimes translated, as we say; that is, in females, the breast swells, and in males, the testicles become swollen and painful. This accident generally happens in consequence of taking cold from some imprudence.

The disease is contagious; that is, it is communicated from one person to another.

Treatment.—In mild cases, very little treatment is required. Keeping the face and neck warm, avoiding exposure to cold and damp, drinking warm infusions of balm, spearmint, or sage, and apply a poultice of flax-seed over the glands until the patient is fully relieved; or the compound powder of jalap, if there be costiveness, is about all that is required. The diet should consist of rye hasty pudding, or brown bread and sweetened water.

If the case be severe, and other glands swell, physic must be freely used, poultices must be applied, and cooling lotions given. Sweating must also be induced by the compound tincture of Virginia snake-root, or by a vapor bath.

In young girls mumps often attack the ovaries and make the invalid a great sufferer for a few days; the testicle of the male is similarly affected at times. These complications call for soothing applications and rest in bed.

Adenoids and Enlarged Tonsils.

Is your child restless in its sleep? Does it snore and snuffle and sleep with its mouth open?

These conditions indicate that the tissues in the child's throat and nose have become enlarged and have closed the air passages enough to hinder breathing.

These enlargements may be either growths called Adenoids or enlarged tonsils. They must receive prompt and careful attention or they may lead to deafness and other serious defects which will hinder the child's growth both of body and mind. A large percentage of deafness in children is due to these causes.



On the Left, the Head of a Normal Child; on the Right That of One Whose Air Passages Are Blocked by Adenoid Growths, Which Have Partially Closed the Tube Leading to the Ear, and May Affect the Hearing.

Children who show signs of trouble of this kind should be examined by a competent physician or surgeon, for the operation is a slight one and will give immediate relief. (See also page 240.)

DISEASES of the CHEST.

DISEASES OF THE CHEST

(Also see Anatomy of the Lungs and Respiratory Organs.)

Consumption.—*Phthisis*.

As it was asserted a short time ago that the incurability of consumption was an acknowledged fact, it is encouraging to know that in many instances now we may effect a cure even under relatively poor conditions, also that many persons have the disease and get well of it without their knowledge. This is proved by the large number of cases that have come to autopsy for death from some other cause and the diseases of the lung which has healed are discovered. If the disease can be taken in hand early enough and the constitution of the person's body protected from these ravages by appropriate climatic conditions, good food, and possibly a little medicine, we are justified in thinking that a favorable outcome will occur. It is necessary to keep the weight of the person maintained and especially the digestion more than good.

Marriage should be avoided by anyone afflicted with the disease, as the bearing of children on the part of the woman will often cause the disease to take a fresh start and the extra effort required by the husband to maintain his family will do the same for him. It is only fair to the friends surrounding the patient that precautions should be taken to prevent the contraction of this disease from one whom they are trying to help, as the disease is propagated by the increase of the germ known as the bacillus of tuberculosis; we must destroy this organism as soon as it is expelled from the person.

In the expectoration these germs are present in very large numbers and in singing and coughing they are sent into the air to possibly be inhaled and land on new soil for future trouble. The kiss of a consumptive is very dangerous and even the use of toilet articles which have been used to wipe the nose or mouth is dangerous until they have been boiled. All expectoration should be received in articles which can be burned before they become dried, and if the person is confined to the house they may be received in an earthen vessel which holds a solution of disinfectant such as carbolic acid, 1 part of the pure acid to 20 of water, or corrosive sublimate, 1 part to a 1000.

It is for this reason that the boards of health of all the large cities of the United States and Europe within the past few years have passed ordinances prohibiting expectoration of sputum on the sidewalks, floors of cars, at stations or public places, and the disease is now reported to

them by physicians under penalty of fine in the same manner as small-pox and diphtheria. Sunlight is another prevention, for this germ cannot live in the rays of the sun and this is taken into account in our treatment of the patient, as good air and sunlight are perhaps the most important aids in helping us to get the better of the disease.

Methods of Examining the Chest.—Before speaking further of consumption, I propose to do what has never been done, namely, to instruct the general reader very briefly in the method of examining the chest to learn the existence of disease. Perhaps this will be considered a departure, in some slight degree, from my purpose to make this entire book intelligible to the general reader. If so, my reply is, that there are *many* school teachers, mechanics, masters of vessels, and farmers, who have inquiring minds, and sagacity enough to learn the physical signs of chest-disease, and to make them, in many cases, practically useful; and that even readers of little reflection cannot fail to comprehend a portion of my explanations.

Position of the Patient.—In performing percussion upon the front of the chest, the patient should be required to sit in a square position, with the arms hooked over the corners of the back of the chair, and the head thrown a little back.

Instrument with which to Thump.—The index and middle fingers of the right hand are to be brought together, into a line, and used as the percussing instrument. The blow given with these is to be *smart* and *quick*, rather than heavy.

Medium to Thump Upon.—Either the index or middle finger of the left hand is to be pressed firmly upon the surface of the chest to be percussed or struck, and thus used as a pleximeter.

Auscultation.—Listening for the purpose of hearing within the chest the sounds produced by breathing, talking, coughing, etc., is called auscultation.



FIG. 90



FIG. 91

Instruments with which to Listen.—The naked ear is generally considered best for hearing low and delicate sounds; but for hearing

loud and rough ones, it is not so good as the stethoscope, represented by Fig. 90. A still better instrument is the double-eared stethoscope, Fig. 91. It magnifies the sounds very much, and is apt to confuse an examiner not accustomed to it; but when the ear is once familiar with it, the aid it affords is very valuable.

The examiner should pass from side to side, continually *comparing* the sounds upon one side, with those upon the other.

The patient must be calm, and the examiner in no hurry.

Healthy Sounds. — To become skilful either in percussion or auscultation, the examiner's ear must first be trained to healthy sounds.

These are best heard in the child, in whom they are louder than in the adult.

In describing the healthy sounds in the different regions of the chest, I shall refer the reader constantly to Figs. 92 and 93.

Clavicular Region. — This, in Fig. 92, is represented by 1, 1. Upon thumping upon the collar-bones, the sound given out at the breast-bone end should be very clear; less clear in the middle; and dull at the shoulder end.

Subclavian Region. — This is represented by 2, 2, and lies between the collar-bone and the fourth rib, on both sides. It covers a considerable portion of the upper lobe of the lungs. The sound upon striking this place should be very clear.



FIG. 92.



FIG. 93.

The Mammary Region, represented by 3, 3, extends from the fourth to the seventh rib, on each side. In the upper part of this region, the healthy sound is clear; but at the bottom of it, on the right, the sound is deadened by the liver; on the left, by the heart.

The Infra-Mammary Region, 4, 4, lies between the seventh rib and the edge of the cartilages of the false ribs. On the right side, the liver makes the sound dull; but under the left side lies the stomach, which is hollow, and the sound is generally quite loud.

In the Sternal Region, 5, 6, 7, which covers the breast-bone, the sound is generally clear.

The Axillary Region, 8, 8, is in the arm-pits. In this the sound should be clear.

The Lateral Region, 9, 9, is immediately below the above, and yields, likewise, a clear sound.

The Lower Lateral Region, gives a dull sound on the right side and on the left a very hollow one.

Fig. 93 represents the *back* part of the chest. In looking at this, we see the

Acromial Region, represented by 11, 11. In this space the sound is dull, but it has not much meaning.

The Scapular Region, 12, 12, covers the part occupied by the shoulder-blades. It gives rather a dead sound.

The Intra-Scapular Region, 13, 13, lies between the shoulder-blades, on each side of the back bone. If the patient's arms are crossed, and the head bent forward, a clear sound will be obtained.

The Dorsal Region, 14, 14, covers the base of the lungs, and, in health gives, a clear sound.

Observation.—If, now, on thumping upon the chest, we find a dull, dead sound in any spot where a clear one ought to be yielded, we are to conclude that underneath there is not the usual quantity of air; but we cannot tell *merely* by percussing, whether tubercles are deposited there, or the lung has become solid by inflammation, or water has been poured out into the cavity of the pleura. *This* point must be determined by auscultation, etc., to be explained gradually as we go along.

Auscultation of Breathing.—On applying the ear or the stethoscope to the chest, two sounds are heard which immediately succeed each other,—the louder is produced by the ingoing breath, or inspiration; the weaker by the outgoing breath, or expiration. These sounds will be further explained as we go along.

Auscultation of the Voice and Cough.—The chest of a healthy person speaking communicates to the ear no distinct sound, but only a vibratory sensation, called, in technical language, the *pectoral fremitus*.

Over the larynx and windpipe, the examiner may hear natural pectoriloquy; between the shoulder blades, in the space corresponding to the roots of the lungs, natural bronchophony.

Philosophy of Chest Sounds.—The fullness and clearness of sound upon percussion, depends upon the amount of air in the chest.

The sounds called *breathing murmurs*, are caused by the expansion and contraction of the air-cells or vesicles, as the air passes in and out; hence they are called *vesicular murmurs*.

The friction of the air against the sides of the windpipe and large bronchial tubes causes the blowing sound heard in those parts.

In children a larger amount of air enters the lungs, and the air vesicles are expanded with more force; hence their breathing has a louder sound, which is called *puerile* respiration. This kind of breathing, heard in the grown person, is a sign of disease.

The lung tissue is a bad conductor of sound; and the voice is accordingly heard only over those parts where large bronchial tubes are near the surface; heard elsewhere, it indicates disease.

First Stage of Consumption of the Lungs.

Physical Signs.—Dullness of sound on and under the collar-bones. Inspiration shortened; expiration augmented both in duration and intensity. This dullness often first perceived in armpits, or at base and back of lungs.

Occasionally a pulmonary, crumpling sound. Dry, crackling rattles. The resounding of the voice increased at the top of the lungs.

General Symptoms.—A sense of weariness and languor.

Occasionally, slight, flying pains about the chest and shoulders.

A peculiar sensitiveness to the effects of cold.

Breathlessness on moving quick, or ascending a hill or stairs.

In many cases a blue lividity of the lips and roots of the fingernails, and coldness of the hands and feet.

Occasionally, in females, even at this early stage, a cessation of the monthly turns. These usually stop later in the disease.

Observations.—The formation of tubercles almost always begins at the top of the lungs. Laennec and others thought they appeared oftenest on the *right* side first; Louis, Andral Watson, Sir James Clarke, and others, believed they appeared more often on the *left* side. Recent investigations show that they were all mistaken. Tubercles appear first about as often upon one side as upon the other.

The pulmonary crumpling sound is caused by a mechanical obstruction to the expansion of the lungs. It is generally heard only during the drawing in of the breath. The sound is like that produced by blowing upon very fine paper.

Second Stage.

Physical Signs.—*Marked* dullness of sound on the collar bones, and extending below them.

Inspiratory murmur *diminished* in duration and intensity; expiratory murmur *augmented* in both.

In upper lobes of lungs, moist, crackling rattles, succeeded by mucous rattles. Also bronchial respiration, or tubular breathing.

In lower lobes of lungs, *peurile* respiration.

Sounds of the heart heard under the collar bones.

Bronchophony heard in the same parts as bronchial respiration.

General Symptoms.—A quickened pulse; slight fever towards evening, oftentimes amounting to quite high fever.

Great susceptibility to the effects of cold, and liability to take cold easily.

Bowels generally costive; oftentimes seat of pain.

The eye has a peculiar whiteness and lustre.

The skin and mouth become dry in the afternoon; chills occur about midday followed by fever, during which the cheeks are flushed.

As the second stage advances to its close, a dry, burning heat afflicts the palms of the hands and soles of the feet.

Night-sweats occur at this time.

Observations.—A hollow, elastic body, containing air, gives, when struck, a clear sound. The dullness of sound on percussing the chest, arises from the absence of air in the air-cells,—these having been pressed together, or obliterated by the deposit of a mass of tubercles. The destruction of these cells causes the cessation of the respiratory murmur.

This stage of the disease is often accompanied by an inflammation of the mucous membrane lining the air-tubes. The air, pushing its way through the mucous secretions in these tubes, forms bubbles, the bursting of which causes the rattle. The crepitant rattle is produced by inflammation around the tubercles. The moist, crackling rattle is caused by the softening of the tubercles.

The lungs, rendered more soiled by the desposit of tubercles, become better conductors of sound; and this causes the beating of the heart to be heard as far off as under the collar bones.

Bronchial respiration gives the idea of air blown through a tube; cavernous respiration, of air passing into a large enclosed cavity.

Third Stage.

Physical Signs.—In this stage cavaties are formed. If the cavities be small, and considerable tuberculated lung surrounds them, the sound, upon percussion, is still dull.

If the cavity be large, and near the surface, there is occasionally a tympanitic sound with musical tone.

Sometimes a sound is heard like striking a cracked pot.

Gurgling; cavernous rattle; cavernous breathing; amphoric breathing; now and then, metallic tinkling; pectoriloquy; cavernous cough.

General Symptoms.—Great loss of flesh, and weakness; diarrhœa and night-sweats; swelling of the feet and legs; sore mouth; and raising of matter with specks of tubercle in it like crumbs of cheese.

Observations.—The gurgling rattle is caused by air displacing liquids, and the formation and bursting of bubbles. It resembles the sound produced by blowing through a tube immersed in soap-suds.

Cavernous breathing is nothing more nor less than the sound produced by air, breathed in and out, entering and retiring from a cavity. The air appears, sometimes, to one listening with the stethoscope, as if it were sucked into his ear during inspiration, and blown back again during expiration.

Amphoric respiration is simply an *augmentation* of cavernous breathing, and results, of course, from an increase of size in the cavity.

In pectoriloquy, words uttered by the patient seem to pass through the stethoscope into the ear of the listener. The cavity should be empty, moderate in size, and have dense walls, in order to furnish the best specimen of this sound.

Air suddenly driven backward through the windpipe, and out of the mouth and nose, by smart raps upon the chest over a cavity, gives the sound of the cracked pot. It is best heard when the patient's mouth is partly open. The same sound is produced, on the same principle, by locking the fingers of the two hands, and joining the palms, so as to leave a small space or cavity between them, and then expelling the air from that cavity, by gently striking the back of one hand upon the knee.

Causes of Consumption.—The human constitution as shown by Liebig, in his profound work on Animal Chemistry, is governed by two forces, the nervous and the vegetative. The former disposes the particles composing the body to a state of motion; the latter inclines them to a position of rest.

In vegetative life there is motion in one direction only, so to speak; that is, motion which tends to the opposite of motion, namely, rest. In vegetables, whose life is wholly under this power, there is no waste; for here, all ultimate particles, having once taken a place of rest, remain undisturbed. In a tree, a layer of matter once deposited, always remains. Hence there is *growth* as long as the tree lives. There is no power to break up and destroy.

But in the animal body there is motion in two directions, or a circuit of motion. Particles which under the vegetative force have been put to rest, are perpetually being displaced by the nervous energy,

and reduced to unorganized amorphous compounds, to be burned in warming the system, or cast out by the several excretory processes.

So constant is the action of these two forces, that John Hunter compared the human system to a whirlpool, into which the particles of matter are perpetually poured, under the influence of the vegetative power, and out of which they are as constantly whirled by the nervous force.

By a little reflection upon these antagonisms, the reader will see that it is just when the vegetative force transcends the nervous, that the body increases in weight, and acquires that state in which the blood corpuscles abound, and the tendency, if to disease at all, is to that of the inflammatory kind. It is the tonic condition of the system. Nutrition is more rapid than destruction. New particles are laid down faster than old ones are taken up. The body *grows*.

On the other hand, when the nervous force overmasters the vegetative, when the outward or centrifugal motion of the whirlpool prevails, then it is that the body is attenuated, the blood thinned and made serous, and the consumptive or atonic condition is established. *Now*, there is too much motion. The nutritive particles, instead of tending to a state of deposit for the re-supply of waste matter, become fugitive in their habits, perpetually fleeing, like convicts escaped from prison. Introduce this power, in excess, into the vegetable kingdom, and the matter deposited upon the tree, instead of remaining to swell its bulk, would be driven off by the nervous force; and the tree, instead of growing, would be annually *lessened*, become sickly, and die of consumption.

In Tuberculosis, the system is like a field deluged by a flood; nothing can take root. The repeated shocks of the nervous battery sent to the absorbents so quicken them in their work of removing waste matter, that they dislodge much which is not yet worn out, and assist in casting out of the system not a little designed to be used in its renewal. A healthy despoit is thus prevented, and nutrition is at an end. The nutritive arteries, those little builders of the human frame, are overmastered by the stimulated lymphatics; the constructive material is wrested from them, and borne beyond their reach, and the body wastes from want of nourishment. The blood becomes thin and watery; and from the increased serous portion, chiefly albumen, are deposited upon the lungs and other tissues the albuminous tumors called tubercles.

Here is found the cause of that peculiar smallness of bone and muscle, and thinness and tallness of person, so peculiar to consumptives. The absorbents, under the power of a very active nervous system, take down "the house we live in" faster than the nutritive arteries, confused by the motion around them, can effect its reconstruction. It is simply an unbalancing of the antagonistic forces, which build and pull down our earthly tenement. The men that demolish are more numerous and better fed than the artisan builders.

But from the age of seventeen to thirty-five, when the vegetative power is losing something of its extraordinary activity, and the nervous force is showing its highest capabilities,—then it is, as this theory indicates, that tubercular consumption does its dreadful work,—then, that the outward world of this physiological Maelstrom casts upon the shores of mortality so many thinned, exhausted, and lifeless human forms. More than three-fourths of all who sink under this disorder die between the ages just named. The brain, between these points of time, acquires its full size and force.

This disease prevails most, too, in those countries where an enlightened civilization gives to the nervous system its fullest development, as in Great Britain, France, and the United States, and in those where the nutritive process is most retarded by a relaxing climate; and it is scarcely known among those people who are but little enlightened and have small brains, and among those who live in high and invigorating latitudes. As the most enlightened, however, are generally found in temperate climates, and those with the least cultivated brains in low latitudes, the rule is not perfectly explained by facts; yet it shows itself sufficiently to establish its validity, and to afford another proof of my theory.

Bacterial Invasion.

THE views of Pasteur regarding the resistance of the body to disease germs were based on the supposition that the animal body was a natural breeding-place for bacteria of all kinds, which ceased to become dangerous only when there were no more tissues to feed upon, or when the tissues had become choked with the products of the bacteria themselves. Metchnikoff first demonstrated an active bodily defense against bacteria, which in health is fully capable of dealing with the bacteria which gain access to the tissues from the intestines, the lungs and elsewhere. Inflammation is now considered to be a reactionary effort of defense against bacterial invasion, the area of which is generally local. When, however, the bacteria multiply in the blood stream, we have blood-poisoning, or *septicemia*, in which the inflammation is scattered. On the next page we show cuts of the better known bacteria.

Classes of Bacteria.

Shape.—Cocci (round, oval or berry-shaped); bacilli (rod-shaped); spirilli (spiral or curved).

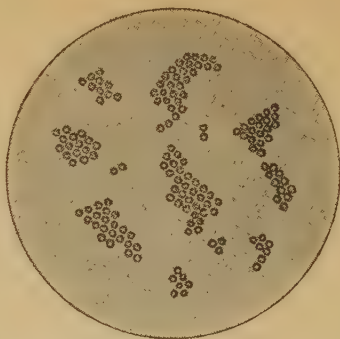
Arrangement.—Occurring in *pairs* they are called *diplococci*; in *chains*, *streptococci*; in *clusters*, *staphylococci*.

Colors.—Bacteria are various colored according to species or variety—violet, green, yellow, orange, red, etc.

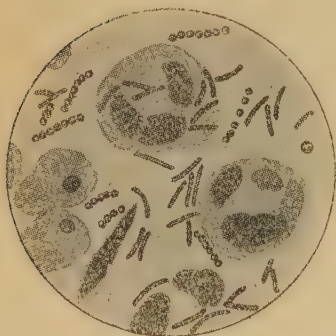
Names.—May designate shape, color, arrangement and function. *Staphylococcus pyogenes aureus* means that the germ is round, grouped in clusters, pus forming, and of a yellow color.



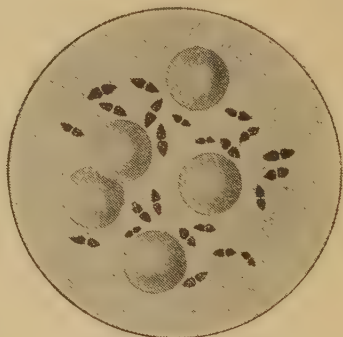
Typhoid Bacillus.



Cancer Bacillus.



Tuberculous Bacillus.



Pneumonia Bacillus.

Size.—1,000,000,000 micrococci can be contained in 1,000,000th part of a pint of water. No doubt some are absolutely undiscoverable.

Air=breathing.—Bacteria requiring air for life are called aërobic; the opposite, anaërobic; those which thrive in either condition, facultative-aërobic.

Food.—Bacteria feeding on *living* plants or animals are called *parasites*; those feeding on *dead* matter, saprophytes; while those growing in a living body, causing pus, are called *pyogenic*.

Pathogenic.—Bacteria which give rise to infectious diseases are known as *pathogenic* (disease-bearing). The principal ones are: the pathogenic staphylococci and streptococci, the cocci of pneumonia, clap, meningitis; the bacilli of the colon, acne, typhoid, pyæmia, tuberculosis, tetanus, diphtheria, influenza, leprosy, anthrax, glanders, catarrh, plague, cholera, the dysentery group, and the spirochæte of syphilis.

Exciting Causes of Tubercular Consumption.

THE preponderance of the nervous force being the state which predisposes to disease, whatever unduly excites the nervous energy invites an attack.

These causes relate, mostly, to the *prolonged exercise of the intellect, the passions, and the sentiments.*

Few are aware of the mischief done by excessive stimulation of the mind during the most active period of life,—especially if the muscular system be left half developed. Here is where ambitious students commit great errors.

The constant plying of the mental powers, in the present modes of educating children, leads to a dreadful abridgment of human life. Better to train the bodily powers first, and let the mental culture come in later time. He who would build a lasting structure must lay a solid foundation.

The age in which we live abounds in the causes of excitement. The world is trembling with excess of mental life. The pine trees burned by the steam-engine are scarcely more numerous than the human constitutions consumed by the train of thought it has set on fire.

Nor are the passions and sentiments less exercised, or less destructive.

Briefly, the causes of consumption embrace all those things which bring a destructive force against the digestive and assimilative functions, as insufficient and improper food, debaucheries, night-watches, sedentary habits, anxiety of mind, etc.; and those which act injuriously upon the breathing organs, as impure air, inflammation of the lungs, pleurisy, measles, hooping cough, etc.; and such as disturb the sweating process, as insufficient clothing, sudden changes of temperature, sleeping in damp sheets, etc. These exalt the nervous force, or depress the vegetative, or inflame the mucous lining of the air-tubes, or the substance of the lungs, or the membranous sack which encloses them, so as to induce one form or other of consumption on the principles I have explained.

The immediate cause of consumption we know, now-a-days, to be due to a deposit of tubercles either in the neighborhood of the vocal cords, the upper parts of the lungs, or, not infrequently, at the bases of the same. These tubercles contain a germ called the *Tubercle Bacillus*, which can only be seen with a high power microscope, and then only after being stained with certain aniline colors which they absorb. These little germs are of the rod-shaped variety of bacilli, and appear under the microscope as little straight lines or rods about $\frac{1}{3}$ inch in length. Their presence in the sputum of a person means tuberculosis of some part of the air-passages; when they are associated with the presence of yellowish fibres (seen under the microscope) they are a proof of the deposit being in the lungs

proper. The examination of one's sputum, therefore, in the early part of any prolonged and suspicious cough, becomes an absolute necessity, since thereby one is made aware, in the earliest stages, of this dreadful disease, and an opportunity offered of attacking it at once in its incipency. This modern discovery has given rise to much experimentation in treatment with the aim in view of killing out the germ. Robert Koch of Berlin announced to the world, a short time ago, that he had discovered an agent, which he called *Tuberculin*, that would eradicate these death-producing germs, but time has shown his efforts to be unsuccessful as yet, although promising of great results in the future. These germs are contagious in character, so that we now can explain why many contract consumption in whose ancestral blood there never existed any tubercular taint.

We know that husband may impart the disease to wife and mother to daughter if only the system is in a receptive state to offer a lodgment to the germs. These tiny but most enduring bacilli retain their life for an indefinite time in the midst of dust and other dried secretions, so that a practical point is that all persons suffering from tuberculous diseases should be exceedingly careful where they spit and with whom they sleep. To raise the sputum into small paper cups which may be burned is a common and very prudent custom.

This discovery, while not disproving the old theory of heredity, nevertheless explains many a case of acquired Phthisis, and clears up many an old-fashioned theory.

These are indisputable facts from which the medical profession at present hope to derive practical benefit by the discovery of some germicide which may be applicable and safe for internal administration.

Can Consumption be Cured? — In many cases it can. It may be cured, first, by the absorption of the tubercles. The celebrated John Hunter shows, in his work on the blood, that the absorbent vessels have a sort of *elective affinity*, by which they take up and remove "all adventitious new matter, as tumors" (tubercles are albuminous tumors), more easily "than those parts which were originally formed." Were this not so, an activity in these vessels equal to the removal of tubercles would cause them to waste all the tissues, and aggravate rather than cure consumption. Probably this does occur where proper hygienic means are not used to quicken the excretions. This hygienic treatment, to be spoken of hereafter, is not generally employed, — certainly not as effectually as it should be. Here is the source of Laennec's fatal remark, so often quoted and so widely endorsed, that nature's efforts towards effecting a cure *are injurious*, and those of art are useless." Laennec's position cannot be true, if Hunter's statement is correct. If the absorbents, by an elective instinct, take up adventitious matter rather than the natural tissues, then the reason why they reverse this rule in consumption is, that by a weakened state of the constitution, the ultimate particles *are not*

well put together, and are more easily taken apart than those of the adventitious tubercular tumors; and if we would restore these vessels to their natural activity, we must improve assimilation, and knit the unloving molecules into a firmer brotherhood. We must make the flesh *hard*, so that the absorbents cannot pick it to pieces. Do this, and "nature's efforts to effect a cure" will not "be injurious."

A second form of cure is the reëstablishment of the assimilative function, the building up of the general health, the arresting of the tubercular deposit, the reducing of tubercles already formed to an indolent state; and then, by a strict observance of the laws of health, keeping them in that condition through life.

A third mode of cure is the healing of the cavities after the tubercles have softened, broken down, and been expelled in the form of expectoration.

A fourth method of cure is a change of tubercles to calcareous matter. These *calcareous* tubercles, Laennec says, "are consequent to tuberculous affections *that have been cured*." And Andral, at one time, hoped to learn how to effect cures by changing tubercles to "the calcareous phosphate."

I have had several cases of cure by this last method, and have quite a collection of calcareous substances which my patients have coughed up,—one of which was raised in my presence by a lady who was a few years before in hopeless consumption, but is now in good health.

Treatment.—This should be of two kinds, local and general.

The local treatment of consumption is by the inhalation of vapors and powders into the lungs. It has been practised, more or less, by individuals, for many years, particularly in Europe; but for some unaccountable reason, the profession generally have never used it, and do not know much about it. I had the honor, some years ago, to bring it freshly before the American public, in some articles written for popular reading, since which time it has been rapidly gaining public confidence, and is now attracting much attention. Conveying the remedy directly to the diseased parts, it strikes the common-sense mind as eminently reasonable and necessary.

I shall speak of inhalation, therefore, very earnestly, not as a palliative of consumption only, but as far more, as a remedy. After long and patient use, my experience allows me to say, that I know it, in many cases, to be such; and knowing this, I should be criminal not to press it upon the public; for it is the great multitude of sufferers, pressing fast through the gate of death, who need to hear words of hope.

Consumption a General Disease.—It is not denied that consumption is a general disease, needing constitutional treatment; but it has also a local development in the lungs, first in the form of aluminous tumors, called tubercles, and then, after the softening,

breaking down, and discharge of these, in the more formidable shape of ulcerous cavities, which, beginning at the summit, devour the lungs down to the base. Can it be reasonable to apply no remedy directly to this local disease? Not so does our profession deal with other local diseases. To an inflamed skin we apply poultices, cold compresses, solutions of acetate of lead, nitrate of silver, etc.; to leprous or scaly affections, sulphuret of potash, bichloride of mercury, zinc ointment, nitrate of mercury ointment, sulphur, creosote, etc.; to weak and inflamed eyes, sulphate of copper, sulphate of zinc, nitrate of silver, and opium; to chronic ulcers upon the skin, tannin, pulverized rhubarb, opium, or cinchona; and to an inflamed throat, nitrate of silver and other articles. These are but specimens of the thousand cases in which we use local remedies. Why, then, when the mucous membrane, which lines the air tubes, becomes inflamed through all its branches, should we neglect, by the inhalation of medicated vapor, to apply a remedy directly upon the whole inflamed surface? Why, when tubercular matter is beginning to be desposited upon the surface of the air cells, and of the small bronchial tubes, should not the vapor go right to those parts, and cause, as it would, the immediate expulsion of this offending and dangerous matter?

Uneducated common sense sees the reasonableness of these suggestions at a glance. Many a person, with pulmonary disease, dies of suffocation, not because there is not muscular strength to expel the matter which is strangling him, but because the lungs *below* the large pellets of mucus, which plug up the bronchial tubes, cannot be inflated, and have therefore no means of driving out the offending substance. Yet a proper medicated vapor, drawn in with the breath, would either dissolve the mucus, or rouse up the expiring membrane to cast it off.

If the reader were to place one end of a stethoscope directly over the disease upon the breast of a person in the third stage of consumption, and should then ask him to talk, the words spoken would seem to rise up through the instrument, and enter, well articulated, into his ear. This, in technical language, is called *pectoriloquy*,—a word signifying *chest-talking*. It implies a *cavity* in the lung. If now the patient be asked to *cough*, a gurgling and splashing sound will be heard. This denotes that the cavity is partly filled with fluid, which is dashed about by the air explosively driven through it by the portion of lung below. Here we have an excavated ulcer, with all its filthy contents, composed of pus, mucus, serum, and dissolved tubercles, lying in it day and night to aggravate its unhealthy condition. What more reasonable, what more necessary, than that a soothing, alternative, or astringent vapor should be drawn into this cavity, to cause its sides to heal, and its absorbents to remove this fluid? A surgeon who should permit an ulcer upon the surface of the body to remain in that condition without a local dressing would be deemed unfit to practise his profession.

Both in tubercular disease and in simple bronchitis, the bronchial tubes almost always suffer some physical change. The mucous membrane lining these tubes is generally softened. At other times the tubes become enlarged through their whole length, so that many of them, from the size of a quill, reach the bigness of the finger of a glove. In still other cases, the straining produced by coughing causes a tube to belly out at some point, forming a sack, which is generally filled with mucus or purulent matter. At still other times, a tubercle will press against a tube so as to flatten it and convert it into a musical instrument, the air, as it is drawn laboriously through, producing a high or low note, according to the size of the pipe. These physical changes are all produced by causes which the inhalation of a suitable vapor, at the proper time, would almost infallibly remove. How strange that this remedy,—so simple, so effectual, so easily comprehended,—should have been so little used!

Right at this vital point in the lungs, where the blood runs in a ceaseless current,—where the whole of it goes *every two minutes* to renew its vitality by contact with atmospheric air,—we have, in thousands of cases daily occurring, inflammation with roughening or softening of membrane, with its consequent harsh breathing; we have mucus, tough or glairy, to impede and interrupt respiration; we have tubercles in the hard or soft state, adding to the general embarrassment, and not only lessening the vitality of the blood, but disturbing all the sympathies of the system,—and yet the practice has been, and is, to attack these central disturbers of life only through the circuitous path of the stomach, lacteals, etc.

I have investigated faithfully the effects of the various substances proposed for inhalation by European physicians, and have explored a wide field of new remedies, not before used, several of which have proved to have qualities of great remedial power.

The chief remedies I employ for inhalation are the following.

Alterative Inhalant, composed of iodine, six grains; iodide of potassium, twelve grains; tincture of ipecac, one ounce; tincture of balsam of tolu, six drams; ethereal tincture of conium, one and a half drams; alcohol, half a pint. These are to be mixed. The dose is one to two teaspoonfuls, to be inhaled ten or fifteen minutes, in about a gill of hot water.

The ethereal tincture of conium is made by keeping a dram of powdered conium in one ounce of sulphuric ether a week.

The above inhalant is used in the tubercular forms of consumption, particularly that of the scrofulous kind, and in many cases of bronchitis.

Expectorant Inhalant.—Take pleurisy root, half an ounce; squill, one ounce; ipecac, two drams; black cohosh, two ounces; queen's root, one ounce and a half; American hellebore, two drams; diluted alcohol, one pint. Grind the roots, etc., and add the alcohol.

Let the whole stand one week, shaking or stirring daily. Draw off and filter through paper. Two teaspoonfuls make a dose, to be inhaled same as preceding.

This is to be used when the cough is hard and dry, and the expectoration difficult. It makes the raising easy, lessening the soreness of the chest, and the harshness of the cough.

Soothing, Febrifuge Inhalant.—Take belladonna leaves, half an ounce; black cohosh, two ounces; American hellebore, half an ounce; poke-root, two drams; aconite root, one ounce; diluted alcohol, one pint. Grind the roots, etc., add the alcohol. Let the whole stand one week, stirring daily. Pour off and filter through paper. Dose, one to two teaspoonfuls, to be inhaled as the preceding.

This is excellent in all cases where the skin is hot, the pulse quick, the tongue and mouth parched, the chest sore, and the system suffering during the whole or a part of each day, from a general feverish condition. It is proper in all the forms of chest disease.

Astringent Inhalant.—Take of wild indigo, one ounce; catechu, half an ounce; Peruvian bark, one ounce; golden seal, one ounce; diluted alcohol, one pint. Mix, and let the whole stand one week, stirring daily. Drain off, and filter through paper. Add two drams of creosote. One to two teaspoonfuls to be inhaled as preceding.

This is to be used when the expectoration is profuse and easy, unattended by fever, either in the latter stages of chronic bronchitis, when the mucous membrane of the tubes is in a relaxed condition, or, in the third stage of tubercular disease, for the purpose of constringing, cleansing, strengthening, and healing.

Antiseptic Inhalant.—Take wild indigo, one ounce; belladonna leaves, half an ounce; diluted alcohol, one pint. Mix, and let the whole stand one week. Pour off, and filter through paper. Then add solution of chloride of soda two ounces. Dose, one to two teaspoonfuls, to be inhaled as the preceding.

This is used in cases of gangrene of the lungs, generally distinguished by considerable expectoration having a very fetid smell.

Anti-Hemorrhagic Inhalant.—Take witch-hazel bark, two ounces; black cohosh, four ounces. Grind, and add one pint of diluted alcohol. Let the mixture stand one week, stirring daily. Pour off, and filter through paper. Add to this two drams of creosote. Dose, one to three teaspoonfuls, to be inhaled as preceding.

This is an excellent remedy for bleeding from the lungs. When there is a tendency to bleed, it should be used for a long time. It may frequently take the place of the above astringent inhalant.

For immediate relief give strong solution of salt water.

Object of Inhalants.—Being vaporized and inhaled, these articles enter every air-cell throughout the lungs. Their object is to soothe and mollify inflamed mucous surfaces, to reduce enlarged bronchial

glands which press upon neighboring parts and cause bleeding, to stimulate the absorbents to take up and remove tubercles, to dissolve tubercles out of the pulmonary tissue, to cause ulcerous cavities to expel their mattery contents, and to stimulate their sides to take on a healing process. They should be used from three to six times a day, the inhalation continuing from ten to fifteen minutes.

Other Inhalants.—Great numbers of other articles have been used, which I have not space to describe. I will mention, however, that the following are sometimes employed with advantage:—

For an Expectorant Inhalant, take alcohol, four ounces; tincture of camphor, half an ounce; tincture of tolu, two drams; naphtha, one dram; benzoic acid, thirty grains; oil of bitter almonds, four drops. Mix.

For an Anodyne Inhalant, take alcohol, four ounces; naphtha, one dram; benzoic acid, thirty grains; chloroform, twenty-five drops; tincture of henbane, half an ounce. Mix.

For an Astringent Inhalant, take alcohol, four ounces; naphtha, one dram; benzoic acid, thirty grains; chloroform, one dram; tannin, eight grains. Mix.

Mode of Inhaling.—For inhaling these, a sponge is fitted into a glass cup, to which a flexible tube is attached. A small quantity of the mixture is poured upon the sponge, and the vapor arising is drawn into the lungs through the tube.

To the expectorant inhalant may be added, occasionally, half a dram of nitric acid.

These latter formulas are the principal ones used by those who practice what is called *cold inhalation*.

A very common mode of inhaling volatile remedies is by saturating a little cotton, contained in a wire basket, with the desired oil or fluid, and placing it over the mouth and nose. It is to be worn throughout the day. Oil of peppermint, creosote, menthol, oil of eucalyptus, etc., etc., are among the more common remedies thus used.

A good inhaler can be bought of any dealer in surgical instruments.

Constitutional Treatment.—The rapid breathing in consumption creates too much oxydation of the blood,—so much, that the muscles, especially the heart, are usually of a *bright red*. To prevent the patient from being literally burned up by oxygen, the blood must be de-oxydated as fast as possible.

While there is too much of oxygen, there is, at the same time, a deficiency of carbon. Hence the cold hands and feet, and the general inability to bear frosty weather. The little nutritive arteries, in these thin-blooded persons, stand shivering and torpid with cold, unable to perform their allotted function of nutrition. There is not fire enough, and fuel must be had in the form of carbon. Hence one of the advantages of *cod-liver oil*. This oil, too, as carbon, devours

the oxygen of the blood, and prevents *its* destroying the patient. This idea also explains the fact mentioned by Bennet and others, that in their post-mortems they found the evidences of healed ulcers in numerous persons who had been *spirit-drinkers* while living. And Liebig helps the explanation by saying that alcohol, taken into the system, circulates in a free state in the blood, and devours its oxygen. To which I beg to add, that the *malaria* of intermittent and bilious fever districts, has been pretty satisfactorily proved to be an instable organic body, consisting of sulphur, carbon, and hydrogen, all of which have an affinity for oxygen, and devour it in the system. Consumption is not found in such districts.

As I am here treating of the chemical effects of remedies (and to this test most remedies must finally come), I will mention that tartrate of antimony and potassa *arrests the circulation in the pulmonary arteries*, — which fact gives a complete and luminous view of its power to prevent oxidation. But I am obliged to detract from its merits, by stating that it *also* retards the circulation in the capillaries of the system generally, and so hinders *de-oxidation*.

Phosphorus. — There is an article which has more recently presented itself to the notice of the profession, to which I wish to invite special attention. I refer to phosphorus. This agent, for a time, challenged our notice in the shape of *phosphate of lime*; but we could never feel sure that this article was dissolved in the fluids of the body. We now use, and with far more marked effect, the hypophosphites of lime, soda, potash, and iron. These are used in the form of the syrup of the hypophosphites. The dose is a teaspoonful before each meal. The effect upon tubercular disease is immediate and gratifying.

Need of Phosphorus. — Cerebric acid contains nitrogen and phosphorus, and is the peculiar component of the brain and nervous system. By combustion and the changes of oxidation in the brain, the phosphorus of cerebric acid is converted into phosphoric acid; so that every act of the brain produces phosphoric acid. How rapid, then, must be the consumption of the phosphoric element of the cerebric acid, in that highly active and excitable state of the nervous system which I have described as peculiar to consumption. And how necessary, in order to save the brain from destruction, to meet this increased demand for phosphorus, by introducing it into the system.

Mulder regards the fibrin of the blood as the *carrier of oxygen*; and by this oxidation, the fibrin becomes converted into the binoxide and trioxide of protein, — its phosphorus and sulphur (for it contains both) being converted into phosphoric and sulphuric acids. Adding phosphorus and sulphur, therefore, as medicinal agents, would seem to be the proper way to supply the fibrin with materials destructive of its freight of oxygen.

It is well known that the salts of phosphoric acid are essential for

the formation of azotic compounds, — compounds which are necessary to sustain animal life. It should be remembered, too, as collaterally illustrating this fact, that the tribasic phosphates of potash, soda, lime, and magnesia, play an important part in the growth and perfection of plants. They are always found in the seeds of the cerealia, and no mature grains are produced where phosphates are absent from the soil. For the production of abundant grain-crops, it is necessary that these salts should exist in the soil, or be applied to it in manures.

It is known, moreover, that in all chronic diseases distinguished by wasting of the tissues, a much larger quantity of phosphates is excreted by the kidneys than in the normal state. Hence there is no healthful growth; and the human organism, like the soil, exhausted of its phosphates by successive croppings, brings nothing to perfection, and needs to have its drained salts re-supplied.

I cannot but call attention here to the inorganic substances found in healthy human blood. According to very careful analyses, by Schmidt:

1000 parts of blood-corpuscles, contain :		1000 parts of liquor sanguinis (serum and fibrin), contain :	
Chlorine	1.686	Chlorine	3.664
Sulphuric Acid	0.066	Sulphuric Acid	0.115
Phosphoric Acid	1.134	Phosphoric Acid	0.191
Potassium	3.328	Potassium	0.323
Sodium	1.052	Sodium	3.341
Oxygen	0.667	Oxygen	0.403
Phosphate of Lime	0.114	Phosphate of Lime	0.311
Phosphate of Magnesia	0.073	Phosphate of Magnesia	0.222

Iron is omitted. Now, I venture the prediction, that out of these figures, mainly, in connection with those which represent the constituents of the saliva, the bile, the gastric juice, the pancreatic secretion, and the organic compounds of the blood and tissues, are to be evolved within a few years a correct and partially demonstrative system of medication. In consumption, all the inorganic bodies represented by the above figures, with the exception of oxygen, are deficient in quantity. By reflecting upon the proportions of these several bodies, particularly upon the large amount of chlorine and soda in the plasma, and of potassium in the corpuscles, the mind can hardly fail to obtain useful hints. I have not hesitated to make one of these hints the ground of a very free use of alkalies, — particularly in the form of bathing.

Sugar of Milk. — There is one other medicinal article which I deem worthy to be made prominent, and to be placed side by side with cod liver oil and the hypo-phosphites. I refer to *sugar of milk*. It belongs to that class of non-nitrogenized articles which Liebig has denominated supporters of respiration. Its great affinity for oxygen is well worthy to be taken into the account, in considering its value in consumption. So great is this attraction, that, with ammonia and other alkalies, it has the power of reducing some of the metallic oxides.

When taken into the stomach, it is rapidly absorbed into the blood, which, being an alkaline fluid, augments its great de-oxidating power to a considerable degree. It unites rapidly with oxygen after entering the blood, forming carbonic acid and water. A part of it, however, does not enter the blood in an uncompounded state, but is changed in the stomach into lactic acid; and this, in the blood, becomes an alkaline lactate. But the portion thus changed appears also very useful; for Lehmann says: "We know of no substance which could better act in the blood as food for the respiration, than the alkaline lactates."

Corroborative of these views is the fact that all those kinds of milk, such as goat's, ass's, etc., which contain the largest amount of sugar of milk, have at different times, and in various countries, obtained a reputation for curing consumption. Goat's whey, in which this article abounds, and from which it is largely manufactured, has been celebrated for its virtues in this line. Ancel speaks of it as an excellent remedy; and Pereira says, "Sugar of milk, in consumptive cases and chronic diseases of the digestive organs, is a most valuable aliment."

One of the best forms of taking sugar of milk is that of a gruel, which is quite palatable, and may be freely eaten by consumptive persons.

Creosote, Guaicol, etc. — Modern researches having proved that consumption, as well as many throat and other diseases are propagated by germs or *bacilli*, as explained on page 269, medical investigators have for a long time been seeking some agent that would destroy these germs without at the same time injuriously affecting the human system. A few years ago Dr. Robert Koch, a celebrated German scientist, who had long been investigating the consumption, cholera, and other microbes, thought he had discovered a lymph that would destroy or at least counteract the consumption bacillus; but unfortunately it proved a failure. Creosote, carbolic acid, guaicol and similar drugs kill the germ when outside the body, and for this reason most therapeutists of to-day use these remedies in as large a quantity, and for as long a time as the system will tolerate. At all events, whatever may be the outcome of the custom at present in vogue, creosote certainly arrests the rapid proliferation of germ-life in the lungs, improves the appetite and digestion, lowers the temperature, and apparently helps the patient. The only offset to the use of this class of remedies lies in the fact that one cannot thoroughly disinfect the blood sufficiently to kill these germs completely. Creosote made from beechwood, taken in three-drop doses with a wine-glass of milk, after food, three times a day, is the usual form of administration. This dose should gradually be increased till ten and even twenty drops are taken at a time. The carbonate of creosote is a more elegant and perhaps more effective form of the drug. This medicine may also be procured in the form of capsules and pills.

By Dr. Cyrus Edison's recently discovered product of carbolic acid, asepsin, it is claimed that seventy per cent of consumptive cases can be cured. It can only be administered as a hypodermic injection, however, at the hands of an experienced practitioner.

The Cough.—The best article I have ever used for this is the "Pulmonic Cherry Cordial." I was five years in compounding this article to suit me, and I believe it to be the very best cough preparation ever made. Dose, from one to two teaspoonfuls.

Pulmonic Cherry Cordial.—Wild-cherry bark, ground, 10 pounds ipecac root, 20 ounces; bloodroot, 24 ounces; squill root, bruised, 12 ounces; pulverized liquorice root, 5 ounces; cochineal, bruised, 2 ounces; anise seed, 32 ounces; fennel seed, 8 ounces; orange peel, 16 ounces; acetate of morphine, 12 drams; alcohol, 8 gallons; water, 8 gallons; pulverized white sugar, 40 pounds; sulphuric acid, 1 ounce.

Directions for making.—Grind all the articles to a coarse powder except those directed to be bruised or pulverized, and put them *all* to the alcohol *except* the wild-cherry bark, the water, the sugar, and the sulphuric acid. Let them stand one week, shaking or stirring thoroughly twice a day. Then, having kept the wild-cherry bark two days in a covered vessel, with water enough upon it to wet it through, place it in a percolator, and run eight gallons of water through it. Add this to the alcohol and other ingredients. Let the whole stand three days longer, stirring as before, twice a day. Draw off, and filter through paper. Now add the sugar, and lastly the sulphuric acid. The acid is intended mainly to improve the color, by acting chemically upon the cochineal. The color is a fine cherry red, tinged with orange.

I have given the directions for making sixteen gallons—this being the smallest quantity in which I make it. Any person can easily make the calculation for reducing the quantity. The assertion previously made that this is the "best cough preparation ever made," I see no cause to modify in the smallest degree. Were it kept in every apothecary shop, and were physicians to prescribe in pulmonary complaints, adding a little syrup of squills or wine of ipecac when a more expectorant effect is wanted, or a little morphine if greater narcotism is sought, it would save them much trouble in compounding cough syrups, and give them much more satisfactory results. I have compared its effect, again and again, with the best other preparations in use, and I pledge my word that it will succeed in twice as many cases as any other compound that may be chosen. Let physicians try it; and I will be responsible for ever hair's breadth in which they find this proportion of successful results abridged.

When a more quieting effect is needed, a little morphine may be added to this preparation; if a more expectorant influence is required, add a few drops of the tincture of *veratrum viride*. For the great

majority of cases, it will be found to be right without any addition. When this is not at hand, any of the preparations (108), (112), (109), (113), (110), etc., may be used. Another good preparation is Dr. King's consumption cure.

Night Sweats.—The very best preparation for these sweats is a compound of the oxide of zinc, one dram; extract of conium, half a dram; to be made into thirty pills, of which one or two are to be taken every night. The sponge bath also does much to check these sweats, and vinegar baths (369). Atropia, $\frac{1}{100}$ of a grain on retiring, and especially Agaricin, $\frac{1}{6}$ grain, will cause the sweats to stop absolutely.

Diarrhœa.—This is a most exhausting symptom in the latter stages of consumption. The only remedy which has much effect in controlling it is the *tris-nitrate of bismuth*. This should be given in doses of thirty grains immediately after, or at the time of each meal. These doses are much larger than used to be given; but they will do no harm. Given to this extent, I find the bismuth very effectual.

Iron.—This preparation, in some of its forms (316), (73), (159), (102), is almost always needed in consumption. If the scrofulous habit be strongly marked, give syrup of iodide of iron, in thirty-drop doses, three times a day. It should be taken in a glass of water. To the feeble administer Gude's pepto-mangan in teaspoonful doses three or four times daily. This is one of the simplest and most efficacious forms of iron we have.

External Irritants.—These are needed where there is much inflammation and soreness of the chest. Blisters should very seldom be used. Croton oil, from two to half a dozen drops, rubbed over the sore part, generally answers very well. Sometimes the mustard paste, applied to the extent of producing redness, two or three times a week, is sufficient. Nitric acid, reduced with water to a strength a little above the strongest vinegar, answers a good purpose for keeping up an irritation.

Atmospheric Inhalation.—It has been said by Laennec and others, that asthma has sometimes the effect of arresting tubercular consumption. Dr. Ramadge thought this was effected by an expansion of the vesicular structure of the lungs; and he reasoned that the same expansion, by mechanical means, would secure a similar end. To effect this, he made his patients take long breaths through a tube constructed for the purpose.

It is manifest that the philosophy of atmospheric inhalation was not understood by Dr. Ramadge, nor has it been by any of his followers in this country.

Rokitansky thinks the tubercular habit depends upon the excess of fibrin in the blood; and says that the reason of consumption being arrested by pregnancy is, that this condition offers a mechanical ob-

stacle to the transmission of blood through the lungs, — thus preventing its excessive oxidation, and keeping it in a venous state. This destroys the fibrinous condition, on which he thinks tuberculosis depends.

Now this is precisely what is done by atmospheric inhalation. The trachea divides, on its entrance into the lungs, into two branches, which again divide and subdivide until the tubes become smaller than can be seen, each terminating in a minute air-cell. Over this entire surface the air is intended to be brought into communication with the blood for the purpose of oxidating it. By forcible inhalation, the air-vesicles are inflated to the extent of their capacity, by which means the extreme branches of the pulmonary arteries are so flattened between these extended cells, as to be able to convey but a small amount of blood, and but little is oxidated. This furnishes a mechanical obstruction to the transmission of the blood, and secures the defibrination of which Rokitansky speaks.

This is my view of the philosophy of atmospheric inhalation. The benefit results, not from a larger amount of oxidation, as is generally supposed, but from a smaller. Asthma does the same thing by producing spasmodic contraction of the extreme bronchial tubes, and preventing air from entering the cells.

The same end is gained in part by certain kinds of employment, as glass-blowing, playing upon wind instruments, and the like. Writers of distinction mention cases of recovery from incipient consumption by a vigorous use of the lungs in singing. Dentists subject their lungs to a similar process of expansion in the use of the blow-pipe; the writer has known several instances in that profession, in which recoveries have taken place.

The Conclusion to which I come is, that atmospheric inhalation may be used with great advantage in some cases, but should never be resorted to except under the direction of a competent physician. In a congested state of the lungs, with hæmorrhagic tendencies, or with inflammation and soreness, it is well fitted to produce fatal bleeding and is of course dangerous.

External Use of Water.— As a relaxation from severe exertions, the ancients had frequent recourse to bathing. Those who contended in the race, throwing the javelin, and wrestling, at Rome, plunged into the Tiber while warm and panting with their efforts. That this promoted prowess and physical endurance, none can doubt.

Louis, the great French authority on pulmonary diseases, lays down several rules to be observed by consumptive patients, and particularly mentions cold bathing.

Few things give tone to the capillaries of the skin like cold water, systematically applied. It rallies the powers of the constitution, and improves assimilation. And by it another object is gained of scarcely less importance, — that of guarding the system against taking cold.

Those in the daily habit of applying cold water to the whole person seldom suffer from colds and catarrhs; they generally become hardened so as to endure the assaults of the elements.

Consumptive persons should generally use the *sponge* bath, with cold water, if it can be endured, otherwise the tepid bath, to be followed, in all cases with brisk rubbing, with a coarse towel. If a sense of chilliness and discomfort follows the bath, a large portion of the water must be squeezed from the sponge, so as to use but very little, and the washing must be speedy, and the rubbing more lively than usual, — beginning with tepid water, and gradually lowering the temperature till it can be borne cold. A large teaspoonful of saleratus to each quart of water should be used.

Diet.

THE diet, like all other parts of the treatment, must have reference to the *present condition* of the patient. If the disease take the bronchial form, and rapid breathing, and other conditions calculated to carry fat out of the system have not yet supervened; or if the patient have thirst and hectic, the diet must be spare and simple, — consisting chiefly of milk and farinaceous substances.

But in all cases where the disease is tubercular, or, being bronchial, has reached the stage of emaciation, the very earliest moment at which the fever can be subdued should be improved to build up the patient with a generous diet. I have seen cases where the stuffing sometimes resorted to for fattening turkeys for Thanksgiving would seem to be almost justifiable. A good rule is to give the most generous diet that can be taken without disturbing the stomach, or increasing the feverish symptoms. Animal food with a good quantity of salt should be freely taken. Fat meats, if well received by the stomach (and they generally are if taken *cold*), are particularly useful. The same is true of sweet butter and cream.

Out-Door Exercise.— Without exercise, as a general thing, the consumptive patient will die. Exercise involves muscular exertion, which is attended by the tension, compression, and greater compactness of the muscles used. Extend your walk a little every day. Stretch it out to the distant fields. Gather flowers from the top of the hills and from the bosom of the valleys, and bring them home as trophies of your victory.

If not able to begin with walking, ride as often as possible in a carriage. The jolting of a vehicle will jog the blood along much better than no exercise.

Horseback riding is still better. It combines, in some measure, the passive exercise of carriage riding, with the active exertion of walking on foot.

If the person who has only a small portion of the lung affected and whose general health and strength has not failed, the employment

of this advice for exercise cannot be too strongly put forth, as it means the continual inhalation of pure air, caused by the exercise, but I would not have a patient who has perhaps been greatly affected by the disease, think that the way is not open to him for improvement. He will of course not be able to exercise so strenuously, in fact, perhaps the majority of cases do not require as much exercise as has been advocated, provided however, they are placed *in a position where an abundance* of fresh air is also available and no symptoms appear which show that the strength is being called upon too vigorously, such as the patient being unable to sleep at night and digestive disturbances occur. But to the cases more advanced in the disease, it should be remembered that exercise will do more harm than good and the whole question will be an individual one as no general rules can be laid down for the patient. For as many hours and days as is possible, the patient should be exposed to the direct rays of the sun and protected from high winds. This may be attained on a high elevation, such as the roof of the house, with a southerly exposure.

If it is so the patient can travel, some high, dry climate about 4000 feet in elevation is the best place, and in selecting this resort the thing to be considered is the number of hours of the sunshine he or she will be able to be subjected to. We do not consider now the degrees of temperature, if the climate is free from moisture, as the patient can be properly clothed and be allowed to remain out of doors all day. The high altitude recommended is also beneficial because the patient is obliged to take deep breaths, thus being obliged to exercise his lungs.

Colorado and certain parts of Arizona and New Mexico in the United States, portions of Switzerland which have an elevation of four to five thousand feet above sea level, and San Moritz, abroad, are examples of suitable places.

Before leaving the subject, and for the encouragement of those affected, from the latest statistics at command, sixty per cent. of early cases have been discharged well from the Adirondacks Cottage Sanatorium.

Trudeau, the eminent authority of the United States, reports that one-third of all the cases under his observation during the past seventeen years are well and that two-thirds of the earlier cases are cured at the present time. Thirty years ago physicians thought that only two per cent. of the cases were curable.

Sea voyages are now not recommended, with the dampness naturally attending the trip, the lack of comfort on the steamer, the short length of time consumed by the trip, its compulsory confinement and the inability to eat nourishing food, if seasickness is present, all weigh against this treatment; in fact, from what has been said, if common sense is used a great improvement can be expected at, or within a reasonable distance of, the patient's home.

Numerous other modes of exercise may be resorted to with advantage. Dumb-bells, adapted in size to the strength of the patient, and used with caution, are highly serviceable. The battledoor, the football, bicycle riding, pitching quoits, and the athletic sports of the gymnasium, all have their appropriate place. The greater the variety the better, as by it all parts of the system are brought into play, and both the mind and the muscles get the change which they need.

It is hard to impress patients with the importance of this subject. Say what you will, they somehow or other get the idea that a moderate amount of exercise, taken when they feel like it, is all that is required. Fatal mistake! Whatever the physician may do, the patient has a great deal to do for himself. He must strive to develop his physical powers to the utmost. He must train himself as runners and fighters do when preparing for their surprising feats; for he is running against the swiftest disease (or the surest winner) of our climate, and fighting with the elements.

If he regards life as not worth this exertion, of course he will not make it; but I beg him to consider that without it recovery will be uncertain, and in many cases, impossible. Do as I have directed, and if your medical attendant is skilful, the current of health will, in many cases, begin to flow back to you. Life will renew to you its policy of insurance, and multiply your days.

Drugs.—Tonics and bitters to help the appetite, iron, strychnine, quinine in very small doses as a tonic; of the heart supporters digitalis may be given when indicated and used carefully under the advice of a physician, cough sedatives of which, perhaps, the most useful is one which may now be obtained at all drug stores, is the Elixir of Terpin hydrate with heroin in the dose of a teaspoonful four or five times a day.

Travelling:—Consumptive patients have generally been sent to a southern climate. But where the case involves dyspepsia and affections of the liver, low latitudes are generally unfriendly. Liver complaints are the bane of a southern climate, and a sallow complexion is the inheritance of a southerner.

Tubercular persons, chilled by our northern climate, are sometimes temporarily relieved by the warmer atmosphere of the south. But the relief is only temporary; for, having lost the power, as they imagine, to bear the frowns of our northern sky, they are dying, and will die anywhere unless they recover this power. And the way to retrieve a lost advantage over an enemy, is, not to retreat to a point where recovery will be harder, but to meet him at once. If the constitution cannot bear up against an enemy under the bracing of a northern atmosphere, it will be still harder to do so under the wilting of a southern.

After all, the objects aimed at should be *change* and *travelling*. The exercise involved, the constant exertion required in getting from

place to place, the agreeable sensations produced by the motion of cars and steamboats, the ever varying change of sights and sounds, and the constantly increasing stock of one's ideas of men and things, — these are what rally the constitution, and open anew the springs of life.

Especially should all journeys for health be taken, if possible, with an object in view. Let the consumptive start with the view of seeing the cave of Kentucky, the prairies of the West, the great lakes of the North, the falls of Niagara, the fortress of Quebec, the Saguenay river, the doctor, who he has reason to think will cure him, — *anything* which he is willing to make exertion to see, and that he is sure his eyes will rejoice in beholding.

I have thus spoken of consumption more at large than of other complaints, because it is the great disease of the world, and is increasing with the advancement of civilization.

Acute Bronchitis.

THIS is an acute inflammation of the mucous membrane lining the air-tubes in the lungs. It is generally quite a serious disease.

Physical Signs. — The sound upon percussion is generally good. If there be any dullness, it is commonly in the lower and back part of the chest. This occurs only in "Capillary Bronchitis."

The breathing murmurs are sometimes more, sometimes less intense than natural. Occasionally they are almost extinct.

In the early stage, sibilous and loud rattles.

In the more advanced stage, mucous rattle.

Now and then sub-crepitant rattle accompanies the inward-drawn breath.

General Symptoms. — The disease begins with chills followed by fever; tightness across the chest, difficulty of breathing, hoarseness, loss of strength, costive bowels, and a quick and hard pulse. Water runs from the eyes and nostrils, and there is a dry, harsh, croupy cough.

After a few days, mucus begins to be raised. This expectoration gradually becomes more copious, and is opaque, yellowish, or greenish, and occasionally streaked with blood. This mucus is very ropy and adheres to the vessel.

There is more or less pain in the chest; pain across the forehead, which is increased by coughing; and a pale and anxious countenance.

In severe cases, the tightness across the chest is extreme, with a sense of suffocation, causing the patient to call for the opening of the windows. There is great difficulty of breathing; a paleness and lividity of the cheeks and lips; a loud wheezing and rattling in the throat, followed by cold sweat, insensibility and death.

In children the disease comes on like a common cold, attended by

a sore throat, a great desire to drink, but a disinclination to take food. But two or three swallows of drink can be taken at a time for want of breath. The phlegm is frequently vomited up spontaneously.

Observations. — The loud and sibilous rattles are produced by similar causes, namely, the passage of air along tubes whose interior is dry and rough from inflammation, or whose calibre is contracted or altered in form by the swelling of the membrane, effusion upon its inner surface of a tough, mucous substance, or a pressure upon its external surface of tubercles, swollen glands, aneurismal tumors, etc. The two sounds differ mainly in the key upon which they are pitched, — the sonorous, or low-keyed, coming from the larger tubes; the sibilous, or high-keyed, from the smaller, — just as the low notes of an organ come from the large pipes, and the high notes from the small ones.

Causes. — It is generally brought on by a sudden cold, by changes of the weather, and by inhaling irritating substances. It is a secondary result, too, of scarlet fever, measles, small-pox, whooping cough, and the remittent fever of infants.

Treatment. — In mild cases, give warm balm or flax-seed tea, hot lemonade, or other similar drinks, — at the same time soaking the feet in hot water, and, on retiring to bed, apply bottles of hot water to the feet and sides, to produce sweating. If the bowels be costive, some gentle physic, as rhubarb and magnesia, or salts and senna, may be taken.

Chloride of ammonia in teaspoonful doses diluted in water and citrate of potassium in 10 to 20 grain doses, or better still, a mixture of

Chloride of ammonia,	3 drachms or teaspoonfuls.
Citrate of potassium,	4 “ “
Compound licorice mixture,	3 ounces.

Shake the bottle.

Take of the above, one teaspoonful diluted with water every three hours.

In the case of infants, an emetic of wine of ipecac, or compound tincture of lobelia, should be given, and followed with slippery elm and flax-seed tea. The compound tincture of lobelia, with tincture of veratrum viride, may be continued for a time as an expectorant.

In more severe cases, both of adults and children, an active emetic is required, — perhaps the compound powder of lobelia is as good as any. This must be followed with tincture of veratrum viride, in full doses, so as to reduce the pulse at once, and keep it down to the natural standard. This is one of the very best articles in this complaint, and will generally very much lessen its violence and duration.

If there is much difficulty of breathing, the air of the room must be kept moist, as recommended in croup.

The room should also be kept warm, — decidedly warmer than in the case of other fevers.

A gentle perspiration should be kept up by small doses of compound tincture of Virginia snake-root, and by frequently bathing the surface, or else by tincture of veratrum.

Mustard should be applied to the chest, and to the soles of the feet.

The cough may be managed by preparations (104), (106), (110), freely given.

The diet should be confined to barley-water, toast-water, apple-water, rice-water, and a solution of gum-arabic.

Chronic Bronchitis.

THIS is an inflammation of the mucous membrane of the air-tubes, which continues a great length of time, without any sudden or remarkable changes.

Physical Signs. — The percussion-sounds are similar to those of acute bronchitis. When a bronchial tube is dilated, we sometimes have dullness around the dilated part.

The breathing murmur is always accompanied by a mucous, sonorous, or sibilant rattle, — sometimes by a subcrepitant.

When dilatation of the tubes exists, the intensity and duration of the sound of the ingoing breath is *decreased*, — of the outgoing *increased*.

In this state of the tubes, we also have cavernous breathing, bronchophony, sometimes pectoriloquy, and bronchial or cavernous cough.

General Symptoms. — A cough is generally present, which is increased in wet weather, and by every slight cold. This comes on in paroxysms; is generally worse in the morning; and is relieved by raising freely. The matter raised is generally yellowish, but sometimes whitish and sticky; and in the latter stages is thick, and sometimes very much like that of consumption. Indeed, the disease often ends in bronchial consumption.

Remarks. — The breathing is bronchial or cavernous when the dilated portion of the tube is empty; if it contain fluid, the mucous rattle will be heard.

Dullness on percussion will exist if a dilated tube press upon the surrounding portion of lung so as to condense or make it solid.

Dilatation of the tubes occurs only in chronic bronchitis of long standing. Its physical signs are much like those of a cavity in advanced consumption. The examiner may learn to distinguish them by considering that in consumption, *dullness precedes the cavity*, while in bronchial dilatations, the *cavity precedes dullness*.

The dilatation or swelling out at some point of a bronchial tube is caused by obstructions to the passage of air through it, — just as

an India-rubber tube, partially closed up at a given point, will bulge out just in front of the obstructed place, when air is forcibly blown through it, and just as the left ventricle of the heart enlarges when the blood is obstructed in its passage through the aortic valve.

Causes. — It often occurs as the result of acute bronchitis, and also of measles, whooping-cough, etc. But taking cold, and damp and changeable weather, are more frequently its causes. It most often follows chronic inflammations of the throat, which, being neglected, gradually creep down the windpipe into the tubes, and become very obstinate in their character.

Treatment. — Medicinal inhalation is one of the best remedies for this complaint. The inhaling powder has, in many cases, great efficiency. The dose is about what can lie on a ten-cent piece. It should be used once a day, in an instrument represented in the cut.

This instrument I had constructed for my use. It consists mainly of a glass tube and a receiver, — the latter being something like a tube-vial, pierced with fine holes around the lower end. The powder is poured into the receiver, which is placed in the larger tube,

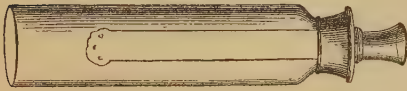


FIG. 34.

and twirled between the thumb and finger while inhaling.

When the powder cannot be easily got down into the tubes in the lungs, — as often happens, — the inhalation of medicated vapor will do better. If the expectoration be difficult, the expectorant inhalant, described under “consumption,” should be used; if the expectoration be too profuse and free, the astringent inhalant must be taken.

The cough preparations recommended for consumption, also (113), (112), will be the proper ones in this complaint.

The daily alkaline bath, and brisk friction, are particularly serviceable.

Out-door exercise is almost as necessary in this disease as in consumption.

Enlargement of the Air-Cells. — *Emphysema.*

THIS disease consists in enlargement of the air-cells, the obliteration of their vessels, and the wasting of their walls.

Physical Signs. — Thumping upon the chest gives a clearer and louder sound than natural, — one which is tympanitic, or drum-head like.

The murmur of the ingoing breath is *diminished* both in duration and intensity, — of the outgoing breath, it is *increased*.

Dry, crepitant rattle attends the ingoing breath only; occasionally, sibilous rattle.

General Symptoms. — Habitual shortness of breath, and very great difficulty of breathing, occurring in paroxysms, which cause the patient to rush to the open window for air.

There is generally a cough, and the matter raised is frothy, liquid, and mucous, or watery.

The face has a peculiar dusky color, and the countenance an anxious, melancholy expression. The nostrils are thick, and the lower lip full. The muscles of the neck are large, and the gait of the patient is stooping. The strength is wasted in proportion to the difficulty of breathing.

Emphysema tends to produce disease of the heart, Bright's disease, and venous congestions in the head.

Observations. — The tympanitic sound is caused by the increased amount of air in the cells.

The air-cells have lost their elasticity, the air, in a great degree, *remains in them*, — not passing in and out, — hence the absence of the vesicular murmur.

The crepitant rattle attends the ingoing breath only, and is supposed to arise from the expansion of the lungs which are in a drier state than natural. It has been compared to the sound produced by blowing into a dried bladder.

Treatment. — To whatever extent the air-cells are destroyed, to that extent, of course, the disease is incurable. It may, however, be palliated and relieved to a great extent.

Generally, bronchitis exists in connection with emphysema; and when this is found to be the case, the remedies for that disease must be employed. (370) often is curative.

The inhalation of tincture of stramonium, in one or two teaspoonful doses, the same as the alterative inhalant is used, will be useful.

To be taken internally, an excellent preparation may be made by uniting one dram of ethereal tincture of lobelia with two drams of tincture of ipecac, and two ounces of ammoniac mixture. The dose is one or two tablespoonfuls. Half-grain to grain doses of extract of *cannabis indica* are excellent to relieve the difficulty of breathing.

The diet must be very carefully regulated, as overindulgence at the table aggravates the symptoms.

Change of air is often highly beneficial; but it is impossible to predict its effect beforehand in each individual case.

Swelling of the Lungs. — *Hypertrophy of the Lungs.*

THIS can hardly be regarded as a disease. It generally takes place in but one lung, and is the result of the inaction of the other. Thus, when one lung is diseased, the other has to do the work of both; and being overworked, it enlarges, as the heart or an arm does when very much exercised.

The only treatment required is to eat sparingly, and exercise with great moderation, so as not to increase the rapidity of the breathing.

Pulmonary Apoplexy.

THIS is generally the result of a disease of the heart, particularly of the *mitral* valve.

Physical Signs. — Percussion yields a clear sound, except where the engorgement of blood is large, and near the surface, — in which case, it is dull.

The sound of breathing is feeble or absent over a limited space.

Bronchial breathing is heard in some places, and bronchophony in part, in the same regions.

Mucous rattle is also heard.

Observations. — In this disease the small air-tubes and air-cells are the seat of bleeding; and the blood becoming coagulated here, closes these vessels against the entrance of air. This explains the feebleness or absence of the breathing murmur.

The fluidity of blood in the immediate vicinity gives rise to the mucous rattle.

General Symptoms. — These are, difficulty of breathing, tightness, and dull pain in the chest. The mucus raised is tinged or streaked with blood. The blood raised is darkish, and dirty-looking. This last symptom, the dirty look of the blood, is peculiar in this disease.

Treatment. — The most important remedy is friction of the chest. This will often arrest the disease at once. Counter-irritation by croton-oil is also useful. A free movement of the bowels by a preparation containing croton-oil, or elaterium (31), (33), has an excellent effect.

Air in the Chest. — *Pneumothorax*.

THIS disease consists in the presence of air in the cavity of the pleura. Generally, there is also water in the pleural sac at the same time; the water, being the heavier fluid, occupying the lower part of the cavity, and the air the upper part.

Physical Signs. — Tympanitic or drum-like sound over the upper part of the side. Dull sound over the lower part. Breathing murmur diminished or suppressed. Amphoric breathing. Metallic tinkling.

General Symptoms. — Great oppression of the chest, and difficulty of breathing; generally attended by palpitation of the heart, and frequently by severe pain under the breast-bone, on the affected side. The patient generally has to remain in the sitting posture, and cannot lie an instant on the sound side.

If, on percussion, one side of the chest sounds louder than the other and the breathing murmur is heard distinctly on the side which gives only a moderate sound, and is not heard at all on the loud-sounding side, we may be sure it is a case of air in the chest.

Observations.—The metallic tinkling is like the sound produced by dropping a pin's head into a metallic dish, or like the distant tinkling of a sheep-bell, or the gentle pulling of the string of a violin.

It is supposed that when the fluid in the cavity of the pleura happens to be higher than the orifice, the air, when it enters at each in-drawn breath, forces its way up through the fluid, in the shape of bubbles, and, bursting at the surface, gives the tinkling sound. This sound is sometimes produced, too, by the falling of drops of liquid from the upper part of the cavity, upon the surface of the fluid.

The amphoric breathing is like the sound produced by blowing obliquely into an empty cask. One writer says he heard the same sound when out shooting on a rough day, produced by the wind blowing sideways into the gun-barrel.

Treatment.—I would recommend the use, two or three times a day, of the antiseptic inhalant, mentioned under the head of consumption.

Sweating must be encouraged in the manner recommended under acute bronchitis.

For the difficulty of breathing, give half-grain doses of cannabis indica, or five-drop doses of tincture of aconite, or one-sixth of a grain doses of svapnia. Extract of belladonna, or of stramonium, is also worthy of trial.

Water in the Chest.—*Hydrothorax.*

THIS disease consists in a collection of water in the cavity of the pleura.

Physical Signs.—There is a dull sound over the effusion.

The breathing murmur is diminished, and gradually disappears altogether over the space occupied by the effusion.

Bronchial breathing is heard in the same part.

When the amount of fluid is small, egophony is heard in the middle regions of the chest.

Bronchophony is heard when the effusion is larger.

General Symptoms.—Either upon lying down, or using active bodily exercise, the patient finds his difficulty of breathing *increased*. When in bed, he lies with his head and shoulders raised, which, by causing the fluid to settle at the bottom of the cavity, prevents, in a measure, its pressure upon the lungs, and gives him a little rest.

His sleep is interrupted by sudden starts with alarm and terror. The pulse is hard, the thirst great, the urine scanty and high-colored, and has a sediment. After a time the feet swell, the face is pallid and livid, and the countenance expresses anxiety and alarm. There is a short, dry cough.

When the quantity of fluid in the chest becomes large, the patient cannot lie down at all, and only gets short and disturbed naps in the sitting posture.

Of all the symptoms, the starting in sleep is the most certain sign of the disease.

Causes.—In some rare cases, this may occur as a primary disease, — that is, as a disease not dependent upon any other as its cause. The greater number of cases, however, are secondary. They arise from organic disease of the heart, or liver, or stomach. Inflammation of the pleura is a very frequent cause.

A plethoric, or full state of the system, predisposes to this complaint, — particularly in those persons who indulge freely at the table.

It may arise, too, from the striking in of skin eruptions; from the free use of liquors; and from frequent excessive bleedings or purgings.

Treatment. — The chest should be painted with the tincture of iodine, and a good degree of substantial soreness be kept up.

The internal remedies are purges (31), (14), (30), and diuretics (128), (129), (130), (131) when the patient is not very weak.

The iodide of potassium, in doses of five or six grains, once in three or four hours, is an excellent remedy. The following is a good form of taking it: iodide of potassium, one ounce; fluid extract of pipsissewa, two ounces; water, half a pint. Dose, one teaspoonful.

The skin should be bathed and rubbed daily, three or four times, with much friction. Tapping the chest should be done when the fluid persists any length of time, otherwise a simple hydrothorax may become a doubly serious empyema or pus in the chest.

Pleurisy.—*Pleuritis.*

PLEURISY, or pleurisy fever, as it is sometimes called, is an inflammation of the pleura, or the membrane which lines the chest, and, at the same time, is folded back so as to cover the outer surface of the lungs.

The pleura, as is elsewhere explained, is a short sac or bag, whose inner sides are kept moist, so that they may slide easily upon each other as they are moved by the alternate contractions and expansions of the lungs in the act of breathing, and whose outer sides are made to grow, — one to the inside of the chest, and the other to the outside of the lungs.

Pleurisy and lung-fever, then, must be kindred diseases, and exist, more or less, together. In truth there is almost always some affection of the pleura in lung-fever, and some affection of the lungs in pleurisy. The pain in lung-fever is owing to some inflammation of the pleura; and the appearance of the rusty-colored phlegm in pleurisy indicates that the lungs have been reached by the inflammation of the membrane which covers them.

Physical Signs.—Flatness on percussion, at the lower part of the chest, which ascends as the effusion of water increases.

If the effused fluid is not great, there is puerile breathing at the top of the lung.

Friction sound is heard occasionally in first stage of disease.

Egophony is heard when the amount of fluid in the pleura is small.

As the amount of water increases, bronchophony appears.

General Symptoms.—This disease is most frequently introduced by *shiverings*, which are soon succeeded by high fever, with a peculiarly hard, resisting pulse; sharp, *stabbing* pain in the side,—generally just below the nipple, but sometimes extending to the shoulder, arm-pit, and back; hurried and interrupted breathing; and a short, dry cough.

The pain is greatly aggravated by motion, coughing, or an attempt to take a long breath. It holds the patient under constant and powerful restraint. We find him lying upon his back, or his well side; his countenance full of anxiety,—fearing to move, cough, or even breathe needlessly; and often crying out from the keen torture these necessary acts inflict in spite of all his caution.

At a more advanced stage, when the tenderness has somewhat abated, he will prefer to lie on the diseased side, as this leaves the healthy lung more at liberty.

Observations.—The first effect of the inflammation of the pleura is to dry up the moisture with which its inner surfaces are lubricated, or made smooth and slippery. As a consequence, these surfaces become rough, and rub harshly upon each other, and produce a sound, in the early stages of pleurisy, like that of rubbing two pieces of wet leather together. It may be imitated by rubbing the finger back and forth upon a table. It is sometimes a creaking noise, like that of new shoes.

As the disease advances an important change takes place in the state of things. Instead of an unnatural dryness, a watery fluid is poured out copiously from the inflamed surfaces of the pleural sac. This is called *the period of effusion*. This generally, though not always, relieves the pain. But, by compressing the lung, causes dangerous difficulty of breathing.

The air-cells are compressed by the effused fluid, and are not penetrated by air. Hence the absence of the breathing murmur.

The pouring out of water between the layers of the pleura, compresses the lung, and removes it from the walls of the chest. Hence the dullness or deadness of sound upon percussion.

When listening with the stethoscope, the voice of the patient sounds feeble and interrupted, like the bleating of a goat, and is hence termed, *egophony*, or *goat-voice*.

This peculiar voice is heard only when the effusion of water has been moderate in quantity, and only a thin layer of liquid lies between the ribs and lung. It is caused by the voice passing over this thin layer, which is thereby thrown into *vibrations*, or wavy, quivering motions. When thus agitated, the fluid reacts upon the voice, making it sharp and tremulous.

When the effusion has become large, these effects cease; but another sign then shows itself, and distinguishes pleurisy from the healthy state, and likewise from the solid, hepatized state of the lung in lung-fever. It may be discovered thus:

If the hand be laid flat upon the chest of a healthy person, while he is speaking, a *vibration* or *thrill* will be left. If, in like manner, the hand be laid upon the chest of a person having lung-fever, with hepatized lung, this thrill will be found still more perceptible. But when the hand is placed over the place of watery effusion on the chest of a person having pleurisy, there will be discovered, when the person speaks, *no thrill whatever*. *The absence of this thrill, then, is one of the very best signs of pleurisy with effusion.*

Persons recover from pleurisy sometimes very rapidly, before effusion has taken place. It is then said they have had an attack of *dry pleurisy*. When liquid has been poured out, even in considerable quantity, it is sometimes reabsorbed, and the patient recovers perfectly. In other instances, it compresses the lungs, interferes seriously with breathing, reduces his strength, and he sinks rapidly.

Treatment.—Pleurisy has been divided for description and treatment into three stages, following the natural events of the inflammation. The first stage comprises the period from the first onset to the time when effusion commences. The second stage, or stage of effusion, extends to the time when the liquid begins to diminish; and the third stage consists of the period occupied by the absorption of the liquid.

Should the quantity remain stationary or diminish very slowly after the lapse of two or three weeks, the disease becomes chronic.

The indication for treatment during the first stage is to arrest the progress of the disease, to diminish its intensity, to limit the amount of morbid products, and to relieve suffering.

If the patient is full-blooded and has a hard, frequent pulse, accompanied with extreme pain and fever, tincture of *veratrum viride* in 5 drop doses, or tincture *aconite* in 2 drop doses, should be frequently repeated. If the patient is weak and exhausted give tincture *digitalis* in 5 drop doses the same way. If effusion has not already begun a

strip of lead plaster twelve inches wide and long enough to extend around the chest from the breast to the back bones, should be tightly stretched over the ribs on the affected side. Hot turpentine fomentations frequently changed, or (130) will do much towards alleviating the pain. If the effusion has begun give a mixture of the acetate of potash 30 grains and infusion digitalis two teaspoonfuls every 3 or 4 hours.

It is well to administer salicylate of soda in 10-grain doses every three hours till a little ringing is heard in the ears, then once in four hours. This drug increases the action of the skin and kidneys and overcomes the rheumatic element present in most if not all pleurisies. The diet should be dry, all liquids being excluded, that the abstraction of water from the chest may be favored.

Nothing gives so much and such immediate relief to pain as a subcutaneous injection of morphine. Aconite also is a valuable sedative in this stage. It may be given in half or whole-drop doses every fifteen minutes for two hours; then afterwards a drop, to be repeated hourly till some impression is made upon the heart's action. Smaller doses are to be given if the pulse becomes feeble.

In the second stage, if the acute symptoms have yielded to treatment, as they usually do, the object of treatment is to promote the absorption of the fluid. This is done by the judicious use of saline cathartics and by diuretics, for the bowels and the kidneys are the natural pumps of the system.

The application of counter-irritants is also of use for this purpose, such as the tincture of iodine. If at any time during this stage the effusion is rapid and excessive, so as to endanger life, it is to be drawn off by puncturing the chest between the fifth and sixth ribs on the side with a small trocar, and the fluid is to be drawn off by suction.

Convalescence commences when the liquid begins to be absorbed; and active medication should then cease, and that course should be pursued which will lead to the restoration of the general health. This is done by tonics, a nutritious diet, and other hygienic means. If the effusion ceases to be absorbed or the process takes place very slowly, then that state of things exists which is called chronic pleurisy. Then the main objects of treatment are to effect the removal of the fluid, and to develop and sustain the powers of the system. Under these circumstances, it is better to discontinue remedies which act upon the bowels and kidneys, at least for a time, and try general

treatment. This consists of tonics, stimulants, and general exercise in the open air, and with this the surgical removal of the fluids from the cavity of the chest.

The operation is now so much improved, and is so safe and simple and attended with so little pain, that it has become an every-day practice, and an operation which was only resorted to as an extreme measure to save life, is now admissible whenever the pleural cavity remains filled with liquid, after only a brief trial of the remedies assigned to promote absorption.

Lung Fever. — *Pneumonia*.

THIS disease, by common usage, has been called a fever; but by physicians it is reckoned as one of the *inflammations*. It is inflammation of the *lungs* or *lights*; and whatever fever there may be results entirely from this local inflammation.

For the purpose of more clearly describing this complaint, it is found convenient to divide it into three stages, or degrees of progress.

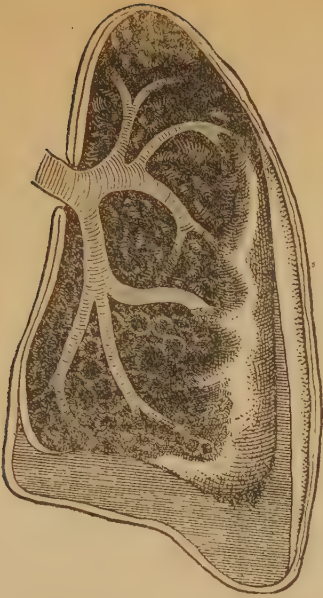
First Stage. — This is called the *stage of engorgement*. The lungs during this stage are *engorged* or *crowded* with blood. If we could inspect them, we should find the inflamed portion *redder, thicker, and heavier* than usual. We should find them weaker, that is, more easily torn than in the natural state; with less air in them, and consequently crackling less upon pressure, — yet not entirely destitute of air and crackling, and not so heavy as to sink in water. Rapping upon the chest at this period gives out a flatter, duller, or less hollow sound than usual. On applying the stethoscope, we hear less of the natural *rustling* sound of health; and, either mingling with, or overcoming it, we hear a minute *crackling* sound, as the air passes in and out in breathing.

This crackling has been compared to that produced by fine salt thrown upon red-hot coals; or by that of rubbing a lock of fine hair between the thumb and finger near the ear. It is caused by small bubbles of air being forced along the moist and sticky sides of the small tubes and air-cells. It is heard only while the breath is being drawn in.

Second Stage. — If the inflammation advances to the second stage, the swelling of the diseased lung increases so as to force out the air entirely, and it becomes *solid*, and wholly useless for the purpose of breathing. In solidity and general appearance, it resembles a piece of liver. Hence it is said to be *hepatized*, or *liverized*; and this is called the stage of *hepatization*.

As the lung grows more solid, its vitality and strength diminish; it is not near as strong as a piece of healthy liver, though it looks like it; it is soft and easily broken; indeed it seems to be in a state of commencing decay or rottenness. Hence some writers, in order to be more precisely correct, call this the stage of *red softening*.

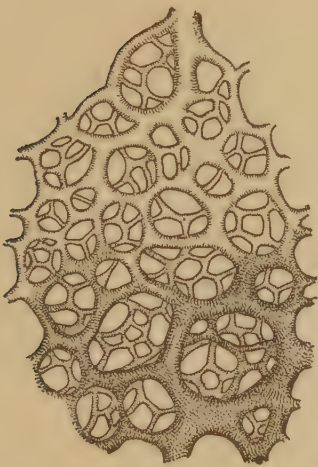
Lungs and Their Diseases.



State of the Lungs in Pleuro-Pneumonia.



State of Lungs in Consumption



A portion of the tissue of the Lungs showing Blood Vessels, Capillaries and Air Tubes—magnified 50 diameters.

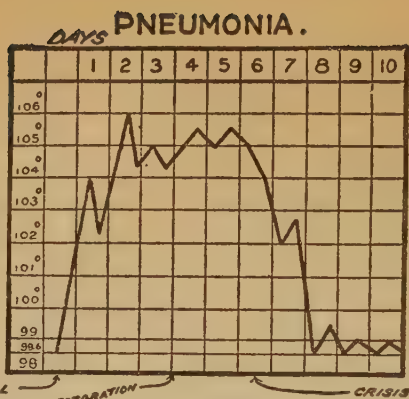


Consolidation of Lungs in Vesicular Pneumonia.

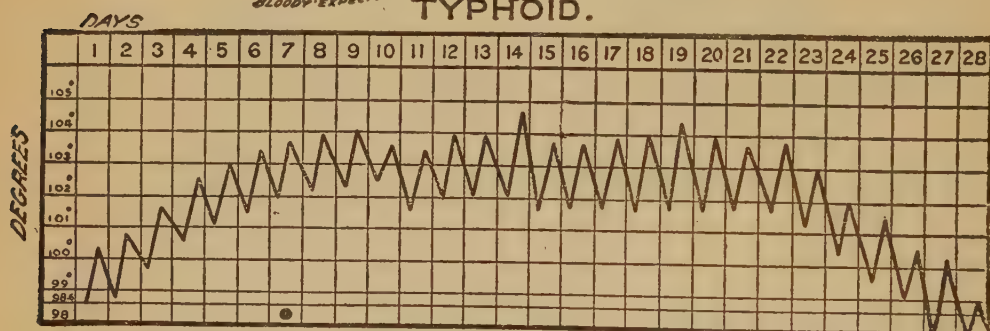
For healthy condition of Lungs see Manikin.

CHARTS OF VARIOUS DISEASES

SHOWING THE RISE
AND FALL OF TEMPER-
ATURE OF PATIENTS.

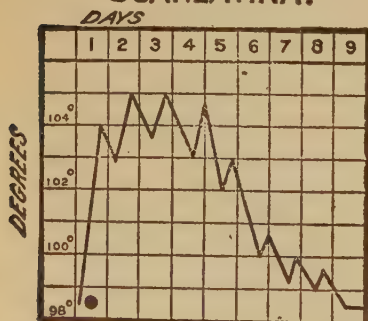


THE TIME
ERUPTION APPEARS
IS SHOWN
BY THE
BLACK SPOTS

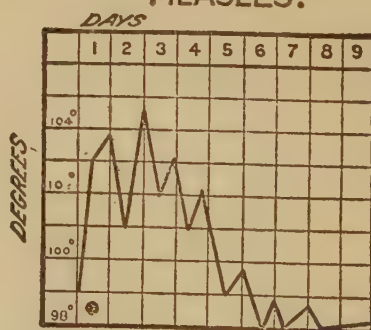


● = BLACK SPOT AT END OF FIRST WEEK SO CALLED ROSE-
SPOTS — FAIRLY MODERATELY SEVERE CASE WITH COMPLICATIONS.

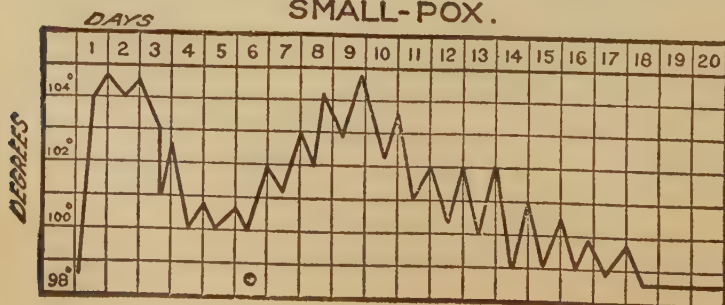
SCARLATINA.



MEASLES.



SMALL-POX.



With increased solidity, there is of course increased dullness on percussion. When the stethoscope is applied to the chest, we hear no sound of air passing into and out of the diseased lung; no natural rustling, or minute crackling; but in their stead, we have a kind of whistling, produced by the air passing back and forth in the wind-pipe and its branches, but finding no entrance into the solidified air-cells. The breathing sometimes sounds like a sort of puff, — owing to the column of air rebounding when refused admission to the closed-up cells.

The general symptoms now increase in severity. There is greater difficulty of breathing; the phlegm is more gluey; perhaps some delirium shows itself; and the patient grows weaker.

Third Stage. — At this period, the lung changes from *red hepatization* or *red softening* to *gray hepatization* or *gray softening*, and matter is now found diffused through its whole substance. The percussion sounds are much the same as in the second stage. On listening, we hear more of the rattling sound produced by disturbed phlegm. The matter raised is thinner, — more like liquid; and looks like prune-juice. The symptoms generally indicate that the patient is sinking. Patients may recover from the first and second stages, but rarely from the third.

Symptoms. — For several days before the disease is pronounced enough to make the patient appear very sick there is a general discomfort of the principal air passages, especially the nose and throat, in fact, a great many cases of pneumonia follow a so-called cold, which has been present for two or three weeks. In others, and in this disease perhaps the first symptom to be noticed is a chill, mild or severe, which has no influence upon the severity of the disease that is to follow. Following this chill comes the fever and usually the so-called pluritic pain over some portion of either lung, many times it appears to be over the nipple of the side affected, or it may appear in the lower chest or even in the back. Shortness of breath caused by the pain when a deep inhalation is attempted then appears, and though the pain in the chest may diminish, which is frequently the case, fever and shortness of breath continues; the appetite leaves, thirst appears to a greater or less extent, the bowels are usually sluggish, the flush shows on the cheeks and a distressed, hacking cough, suppressed if causing too much pain, and the raising of a scanty, dark reddish phlegm, which, when expectorated into a vessel has a tendency to stick to the sides, and does not flow freely like saliva. The disease rapidly assumes a severe condition, and in favorable cases remains about the same for five to eight days. During these days mentioned, the so-called crisis occurs, which is the sudden dropping of the temperature from 102 to 104 at which height it has been, down to the normal, which is 98½ degrees. The respiration during these times is rapid and short. The sickness of the patient progressively increases the

pulse which is around 100 to 130. The mind is many times clouded, especially in children or those addicted to liquor.

Treatment.—It is well to understand that in this most serious disease the best care and maintenance of strength is absolutely required. There are a certain number of cases that will die in spite of the best treatment that can be obtained, another number will get well if not given the wrong treatment or neglected, but a large middle class between these two extremes will need careful treatment to carry them through to recovery. There can be no absolute routine treatment in pneumonia, as the condition of the patient will demand how much stimulation is needed and what degree of lung tissue is affected. In the early stages of pneumonia, some depressant to the increased circulation which will be seen by the rapid beat of the pulse, is needed, a tincture of aconite or of veratum viride in one drop doses repeated every half hour until five or eight doses have been given. Although the temperature will be increased at this time, a hot mustard foot bath will help the aconite in its action and relieve temporarily the congestion of the lung. If violent pain in the chest, due to pleurisy is present, small doses of Dover's powder which may be obtained at drug stores and which consists of ipecac which is a sweat producer, and morphine which is a pain quieter, and the combination of these two, act most happily upon the system in this condition. Thus 5 to 10 grains of Dover's powders repeated if the pain continues, every three or four hours will often give great relief. This remedy must be used only during the first two or three days, as later on they will only tend to further depress the heart, which may by this time be showing the effect of the disease. It will now be necessary to see that the eliminating organs of the body, such as the bowels, the kidneys and the lungs are kept in a state of active work; an expectorant such as the prescription recommended under bronchitis consisting of chloride of ammonia, citrate of potash and licorice mixture will enable the patient to raise the phlegm and the citrate of potash will exert a favorable action of the kidneys. It then remains for us to keep the heart in as good condition as possible, care being taken not to over-stimulate as the chances are good for all the stimulants we possess to be needed before the patient is through the crisis. This is done by the use of strychnia, the most favorable and digitalis and alcohol in the form of whiskey and brandy in the order named. Strychnia may be given on the second and third days, or if not needed then, when the acceleration of the pulse to above 110 renders it necessary. The dosage may be at first 1-60 of a grain four times a day; when this dose ceases to hold the pulse at 110 the dose may be increased to 1-40 of a grain every four hours, and even later again increased to 1-30 or even 1-20 of a grain, but of course, these later doses *only on the advice of the physician who has*

taken charge of the case. Whiskey or brandy in tablespoon doses for adult every four to six hours will be of temporary service in tiding the patient over attacks of heart failure. Digitalis in the form of tincture given in doses of 10 drops three, four or five times during twenty-four hours may be needed after the third, fourth or fifth days. The fever will often rise to 103 or 104 degrees and remain at this point, but as the disease will turn sometime between the fifth and eighth or ninth days we do not have to use strenuous measures to reduce the fever unless the patient is very nervous or delirious. In this latter case tepid or cool water sponging will often relieve the nervous troubles by reducing the fever and enabling the patient to sleep without artificial aid. A jacket made of sheet-wadding and kept about the chest is a good precaution if constant care of a nurse is not given. This will often tend to reduce congestion and surely keeps the chest from exposure to changes in temperature, should the patient throw off the clothes. In emergencies which may occur at any time during the course of the disease and to be watched for especially at the crisis or turn of the disease, the aromatic spirits of ammonia in half teaspoonful doses diluted with water may be given every hour for the stimulating effect. Oxygen is often of value though many times used without effect. It will quiet labored breathing to some extent and supply the blood with a necessary article which the consolidation in the lung is withholding from it. As soon as possible withdraw what unnecessary stimulation is being given and through the convalescence give the expectorant mixture and nourish well with eggs, broth, milk and light but concentrated articles of diet.

Typhoid Lung Fever. — *Typhoid Pneumonia.*

THIS is an inflammation of the lungs, differing from the preceding only in the character of the fever attending it, which is of a low, typhoid character. The disease, like typhoid fever, is characterized by great debility and prostration.

Symptoms. — These are a combination of the symptoms of pneumonia and of typhoid fever. The disease begins with great weariness, lassitude, dizziness, pain in the head, back, and limbs. Soon there is much difficulty of breathing, tightness across the chest, with a dry, short, hacking cough.

As the disease advances, the active symptoms pass away; there is a dull pain across the chest; drowsiness is very apt to come on, with the various symptoms of sinking peculiar to typhoid fever. The skin is harsh and dry, the temperature uneven, the tip and edge of the tongue red, and the middle covered with a yellow or brown fur. The bowels are tender, swollen, and drum-head like; while there is often a diarrhoea, — the discharges having a dirty-yellow color.

Treatment. — This should be like the treatment of pneumonia and typhoid fever united.

Great care must be taken not to use *reducing* remedies. While active purging must not be used, yet, if there are symptoms of an inactive state of the bowels, podophyllin and leptandrin (34), (39), may be employed with advantage.

When there are symptoms of great depression, use tonics (46), (48), (50), (53), (60), (64), (67), (73), taking care to keep the cough loose by flaxseed, slippery elm, and marshmallow tea, and by some external irritant.

Broncho-Pneumonia.

THIS is an infectious inflammation, characterized by an exudation from the blood-vessels, the formation of new connective tissue, and the growth of bacteria. The disease involves the walls of the bronchi and the air-spaces surrounding the inflamed tubes. It is frequently called capillary bronchitis and catarrhal pneumonia. It is the ordinary pneumonia of children, and is frequently seen in young people.

It comes on primarily, but is often secondary to measles, whooping-cough, etc.

Symptoms. — In the very young, the only symptoms are fever, prostration, and rapid breathing. There is no cough, no physical signs, but the disease is, almost always, fatal within a few days' time.

There is a great difference in the invasion of the disease in different cases, the severer cases being ushered in by one or more convulsions, by rapid rise of temperature, vomiting, difficulty in breathing, and delirium; the milder cases beginning with lower temperature, moderate prostration and shortness of breath.

The height of the temperature is, as a rule, in proportion to the severity of the disease. Temperatures of 105° and over are usually fatal. The pulse reaches 150 to 170 in adults, and even higher in children, — so high, in fact, that it cannot be taken. The respiration varies from 40 to 80. Sleeplessness, restlessness, and even delirium are frequently present. The face is flushed, the tongue coated, and oftentimes diarrhoea and vomiting occur. Cough is usually present, and in the young the sputum is swallowed. The urine is frequently albuminous and contains casts.

Between the second and fifth days the signs of consolidation and pleurisy appear, i. e., dullness on percussion, bronchial breathing and bronchophony with crepitant rattles.

The duration of the disease in children varies: of the fatal cases the majority die within the first fortnight. The cases which recover vary from one to three weeks, though many persist for six and eight weeks. The softening and absorption which occurs in all pneumonias that recover occupy a much longer period in broncho-pneumonia than in lobar pneumonia.

Many cases of broncho-pneumonia are complicated by *cerebral* symptoms of convulsions, delirium, stupor, vomiting, etc., even before

any marked lesions in the lungs appear; as these subside the lung symptoms appear. Many cases are protracted for a long time, and though they may terminate favorably at last, yet they are apt to run into a chronic hardening of the lung which lasts for years; or they recover with a permanent consolidation of the lung. Some die of exhaustion.

Treatment. — The use of hot fomentations and poultices over the chest and the administration of small doses of ipecac and aconite at short intervals soothe the bronchitis and pain.

For the cerebral symptoms, phenacetin and the bromides are very useful. Aconite and digitalis are usually employed when the pneumonia stage comes on. As a rule stimulants are not required in children, in whom the disease most frequently occurs.

In convalescence, iron, quinine, cod-liver oil, oxygen and a change of air are to be recommended.

Other Forms of Lung Inflammation.

OF the various other forms of lung inflammation which occur, mention may be made of pneumonia dependent on Heart Disease; Interstitial Pneumonia, or the formation of new connective tissue and obliteration of the air-spaces; Tubercular Pneumonia, which is caused by the presence of tubercle bacilli; Acute and Chronic Miliary Tuberculosis, characterized by the presence of numerous minute nodules called miliary tubercles; Acute and Chronic Tubercular Consumption; Gangrene of the Lung, where a portion of the lung has lost its vitality and the germs of putrefaction have entered.

Asthma.

Asthma may be defined to be great difficulty of drawing in the breath, — coming on suddenly, sometimes gradually, — accompanied with a sense of extreme suffocation, and a desire for fresh air; continuing for a longer or shorter period, and then passing away, and leaving the patient a period of comparatively easy respiration.

Symptoms. — There are sometimes no premonitory symptoms, the attack coming on suddenly, and without warning; but more frequently there are, for some days before the onset, loss of appetite, flatulence, belching of wind, irritability, languor, chilliness, oppression, and drowsiness. The hard breathing generally makes its appearance in the night, — quite often at three or four o'clock in the morning, when the nervous system is at its lowest ebb. There is first a sense of tightness, or stricture, across the chest, which seems to expand with difficulty. The patient can no longer remain lying down; he rises up, draws up his knees, and, leaning forward, puts his elbows upon them, and his head upon his hands, and then struggles hard to draw in his breath; which, passing in slowly and

laboriously, produces a loud wheezing sound. Sometimes he feels that he must have fresh air, and, rushing to a window, puts his head far out, to catch a stirring breeze. The hands and feet are cold, the face haggard and distressed, — sometimes a little red and swollen, but more generally pale and shrunk, — the body wet with perspiration, the pulse irregular, feeble, and small, though sometimes not disturbed. These symptoms continue for some hours, more or less, when the breathing becomes more easy, and there is a little phlegm raised, sometimes considerable. This cessation of difficult breathing may be complete, or only partial; and lasts for a longer or shorter period, when the attack again recurs.

Causes. — It is well known that Asthma has its cause mainly in the nervous system. The air-tubes are encircled with a series of little bundles of fibres, which are, in fact, muscles, and like all other muscles have the power of contracting or shortening themselves. These muscles, too, like all others, have nerves distributed to them; and when these nerves become diseased or irritable, they will become disturbed on certain occasions, and cause these small, circular puckering strings to contract and close up the air-tubes near their terminations, very much as the puckering-string closes the mouth of the work-bag, so that very little air can pass into the air-cells, and that little with great difficulty and slowness. When these contractions take place, and the air is thus shut off, the result is a fit of asthma. This disease may be brought on by any of those states of the atmosphere which disturb or irritate the bronchial surfaces, or by any of the numerous causes which mysteriously unbalance the nervous system. A fit may be brought on by whatever disturbs the mind.

In addition to this cause which is known as the bronchial type of asthma there are the cardiac and nephritic types. The so-called cardiac asthma, in the early stages is perhaps more amenable to treatment than the bronchial type but its course would not be effected by the drugs given for the latter type and appropriate remedies for the heart must be given. In the nephritic type the asthma is due to the retention in the system of the poison which is prevented from passing out of the body in the urine because of disease of the kidneys.

Treatment. — The disease has been regarded as extremely difficult of cure. There are certain remedies, however, which have a remarkable control over it, and, if skilfully used, will frequently bring it to a complete termination, and, even in the worst cases, to a state of very great mitigation and improvement.

Inhalation. — The most important and certain remedy is the use of the Alterative Inhalant, described on page 273. I have with this article alone effected some surprising cures; yet it is well to combine

other treatment with it. I have had several cases of a most distressing character, — the attacks continuing night and day, — in which the inhalation, judiciously administered, has caused the disappearance of the complaint within twenty-four hours, and in which no return of suffering has occurred for several weeks, and then only in a modified form. This remedy should be used four or five times a day.

Iodide of potassium is a most valuable internal remedy in this complaint; indeed, in a certain sense, it is almost a specific. It should be used (prescriptions 101, 138, 140, 151) at the same time with the inhalation. The following preparation is a very good remedy for this disease: Ethereal tincture of lobelia, two ounces; tincture of asafoetida, one ounce; grindelia, one ounce; iodide of potassium, two ounces; simple syrup, four ounces. Mix. Dose, from a teaspoonful to a tablespoonful, every hour or two.

Several other remedies are used for asthma, with more or less success, such as electro-magnetism, smoking stramonium leaves, burning paper dipped in a strong solution of nitrate of potash, and inhaling the smoke, etc., — but none of these have as much value as the two remedies first named.

For the cardiac type strychnia, digitalis, spartine, strophanthus and cocaine in appropriate dosage must be given to effect an improvement. For the kidney type relief of the system by other channels than the kidneys, until they are in better working order will be necessary. This can be accomplished by the use of saline cathartics such as one or two teaspoonfuls of epsom salts diluted with water, given often enough to cause two or three watery discharges during twenty-four hours. In addition to this sweating of the skin by means of hot lemonade or small doses of Dover's powders in hot drinks may be given.

In as grave a complaint as a severe case of asthma, it is always well to seek the aid of a physician.

Hay-Asthma. — Hay-Fever.

THIS is a very troublesome complaint, which seems to combine the peculiarities both of asthma and of influenza. Fortunately, it attacks but few persons, and those only at particular seasons of the year, — namely, while hay is in blossom, and during hay-making.

Symptoms. — These are a combination of the symptoms of the two diseases above named. There is great irritation of the eyes, with sneezing, and a free discharge from the nose. There is tightness across the chest, difficulty of breathing, and a pricking sensation in the throat. These symptoms often appear in great severity, making the complaint a really distressing one.

Cause. — This disorder appears to have but one cause, — namely, some sort of emanations from the grasses, flowers, etc., while in blossom; which emanations come in contact with the mucous lining of the eyes, nose, and throat, producing very great and teasing irritation.

Treatment.—One of the best remedies for this troublesome complaint is to avoid the cause, by removing, during the flowering and haying season, to some large city, or, still better, close down to the seashore, where flowers and hay do not grow.

Of medicines, the tincture of lobelia, taken in moderate doses, is a very good remedy. Quinine and iron, given in combination (75), are valuable preparations. Strychnine and nux vomica, in connection with iron or otherwise (316), (83), (84), (85), (86), (95), are very useful. Iodide of potassium (101), (138), (140), is also worth a trial. Another very good remedy is the chloride of lime, or the chloride of soda, placed in saucers about the sleeping-room. Pieces of cotton cloth may also be dipped in one of these solutions, and hung about the apartments of the house. The hands and face may likewise be washed, once or twice a day, in a weak solution.

The oxide of zinc and the extract of nux vomica, made into pills, two grains of the zinc to half a grain of the extract to each pill, and one pill taken morning and evening, should not be forgotten.

Of late cocaine, painted by means of a camel's hair brush on the mucous membrane of the nose, has been used to check a paroxysm and mitigate the disease.

The following formula is the most efficacious of this class of remedies and should be painted onto the nasal mucous membrane as high up as possible; its use may be repeated several times till the membrane becomes numb.

Cocaine	12 gr.
Antifebrin	25 gr.
Alcohol	1 dr.
Simple Elixir	3 dr.

Mix and shake before using.

Thyroid Gland.

THE Thyroid Gland is situated at the upper part of the trachea and consists of two lobes placed one on each side of that tube. In appearance and makeup it resembles much the other "ductless" glands (so-called because they have no outlet) and its use has only lately been appreciated.

The Thymus is a similar gland situated just below the thyroid and extending down as far as the pericardium. It likewise consists of two lobes and is covered by the breast-bone. It is only a temporary organ and attains its full size at the end of the second year when it begins to dwindle until at puberty it has almost disappeared. While formerly little was known of the function of these glands recent investigations have proved that in some way not altogether understood the nutrition of the body may be remarkably influenced by their secretions. Its use is based upon the fact that in diseases like dwarfism (cretinism), excessive obesity, psoriasis, scleroderma, goitre, and myxedema there is evidence of structural change, withering, etc., of the thyroid gland.

Inflammation of these glands not only leads to the above diseases but any remedial measures are almost futile unless directed to improvement in their condition.



It is customary to use the dried thyroid gland in powdered form, or made into a tablet or capsule. The dose is one grain three times daily, to be increased as the patient becomes accustomed to it; increase one grain daily until 6 grains daily are taken when the effect is watched for a few days. If no improvement is made the dose is again increased; or if headache, heart failure, and sometimes diarrhoea and vomiting the remedy must be stopped for a few days when it may be resumed very gradually. No more than 15 grains should be given daily, divided into several doses. After marked improvement or an apparent cure has been effected it is necessary to continue the remedy for an indefinite time, giving full doses for several days at the end of 3 or 4 weeks. When used in obesity an increased amount of nitrogenous food should be supplied to prevent loss of strength. Thyroid gland should never be used in diabetes or in exophthalmic goitre. It has proved of value in acute mania, melancholia, and insanities of child-birth and the climacteric. Recently full doses have been recommended in eclampsia and it sometimes relieves the vomiting of pregnancy.

HEART DISEASES.

(Also see Anatomy of Organs of Circulation.)

LIFE rests upon a tripod, — the brain, the lungs, and the heart. These are equally important to its well-being and continuance.

In substance, the human heart is a bundle of muscles, so put together as to bear the greatest possible amount of work. In size, shape, and look, it is much like the heart of the hog. I wish it never had a likeness to it in its moral nature.

The heart is enclosed in a case or sac, called the pericardium. It lies between the two lungs, a little to the left side of the chest. Its point is under the sixth rib on the left side, and its lower surface rests on the diaphragm, — a horizontal partition between the chest and belly.

The heart is double. It has four cavities, — two for receiving the blood, which are called *auricles*, and two for driving it out, called *ventricles*.

The venous, or dark blood, is brought from all parts below, and emptied into the right auricle through the *ascending vena cava*, and from all parts from above, and pour into the same cavity through the *descending vena cava*. From this it passes into the right ventricle, which contracts, and forces it through the pulmonary artery into the lungs, where it becomes *red*, and passes into the left auricle through the pulmonary vein, thence into the left ventricle, which contracts, and throws it out through the great aorta to all parts of the body. Fig. 95 gives a good idea of the circulation through the heart and lungs.

The heart is divided into two sides, which are separated from each other by a muscular partition, — each side having an auricle and a ventricle.

The auricles have comparatively thin walls, as they are only used for reservoirs. The walls of the ventricles are much thicker, being used, — particularly that of the left side, — for forcing the blood over a large surface.

Between the auricle and ventricle on the right side, are three folds of triangular membrane, called the *tricuspid* valves. Between the auricle and ventricle on the left side, are three valves, called *mitral*.

At the beginning of the *pulmonary artery*, and the *aorta*, are three half-moon shaped folds of membrane, called *semilunar valves*.

The office of all these valves is, to close after the blood has gone through, and prevent its flowing back while the cavity is being again filled. They do the same duty, in fact, as the valves of a pump.

Through this heart, thus constructed, all the blood in the body, — about twenty-eight pounds, — passes once in about one minute and a half. This is rapid work; and when we consider that the heart works in this way through the whole life, resting not, day or night, we cannot wonder that it gets out of order.

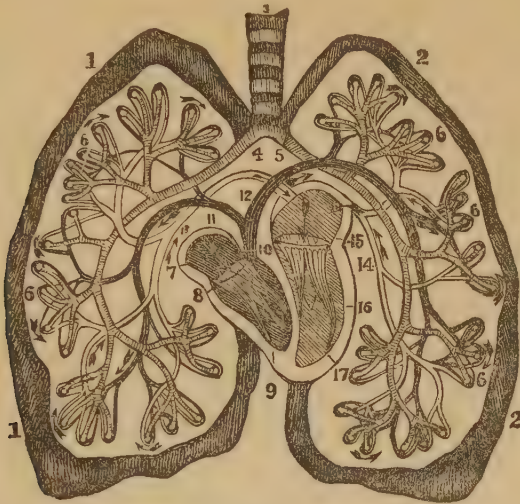


FIG. 95.

The whole heart is seldom affected. The left side is more liable to disease than the right.

Impulse of the Heart.

THE ear, when placed over the heart, feels, at each beat, a slight shock. This is felt at the same time the first sound is heard. This impulse is caused by the apex or point of the heart being thrown up against the ribs by the contraction of the ventricles. It is felt best between the cartilages of the fifth and sixth ribs on the left side.

The Sounds of the Heart.

ON applying the ear to the chest just over the heart, two sounds are heard. The first one is dull and slightly prolonged; the second is a shorter and smarter sound, having a sort of clack. These occur in pretty rapid succession, and then comes a brief interval. And this round of action, first a long and dull sound, then a short and smart one, and then an interval, — called the heart's *rhythm*, — is repeated continually. If the space of time occupied by the rhythm be divided

into five parts, the first sound will take about two parts, the second one, and the interval of repose, the remaining two. The first sound is heard about the time of the contraction of the ventricles, and is therefore called the *systolic* sound; the second is synchronous with the opening of the ventricles, and is called the *diastolic* sound. The syllables *too-to* — *too-to*, very fairly represent the two sounds of the heart. These sounds are heard over the largest space in lean persons.

Percussion Sounds.

If the ends of the fingers be struck upon the chest over the heart, a dull sound will be heard over a space from one and a half to two inches square, — beginning at the fourth rib on the left side, and extending down nearly to the sixth. The dullness is diminished by lying upon the back, and increased by leaning forward, and by taking a full breath. The deadness of sound is caused by the heart being a partially solid body. The lungs which surround it yield a clear sound.

If a solid substance, as large as the heart, were placed on the inside of a drum, against the head, only a dead sound would be obtained by striking on that spot; everywhere else, the sound would be louder.

Altered Sounds of the Heart.

THESE sounds are changed by disease in a variety of ways, both as to their character and duration. One or both sounds may be turned into a noise like the blowing of a pair of bellows. This is called the *bellows sound*. When this sound is very harsh, it may become like the noise of a rasp, or file, or saw. These altered sounds are all produced by an altered condition of the valvular passages through which the blood passes. If you build an aqueduct of equal dimensions throughout, and smooth on the inside, you may send a certain volume of water through, at a given speed, without noise. But if you make sudden contractions in the aqueduct, or allow large stones to project into it, and then attempt to send through the same body of water, at the same rate of speed, you will hear all sorts of noises.

Enlargement or Hypertrophy of the Ventricles.

THIS is simply a thickening, or an increase of bulk, in the walls of the ventricles. The muscles composing the walls of one or both of these cavities grow thick and large.

Physical Signs. — Impulse stronger than natural. When considerable, it is accompanied with a lifting and heaving of the parts. Dull sound on percussion over a larger space. First sound of heart prolonged; second sound feeble. The interval of silence, shorter than natural. In bad cases, the second sound is nearly extinguished.

General Symptoms.—Hypertrophy of left ventricle gives a strong, prolonged, and tense *pulse*. Palpitation more constant than in any other disease of the heart. In advanced stages, the patient is easily out of breath. There is a rush of blood to the head on making exertion or stooping, with more or less throbbing and lancinating headaches, which are aggravated by suddenly lying down or rising up. There are vertigo, ringing in the ears, sparks of light and other illusions before the eyes; also a purplish, violet or livid color upon the cheeks, nose, and lips. In many cases there is a dull, severe aching pain in the region of the heart, and extending towards the shoulder and the inside of the arm.

When the *right* ventricle is enlarged, there is a swelling of the external jugular veins.

Causes.—The walls of the heart are thickened by *overwork*, in the same way that the blacksmith's arm is made muscular and large. All muscles grow in the same way. More action sends more blood to them, and this causes an increase of nutrition.

Whatever interposes an *obstacle* to the passage of the blood through the valvular openings, will cause the ventricles which force it through to work harder. Hence, obstructions in the semilunar valves cause hypertrophy of the ventricles.

Any excitement of the mind, or any great exertion, which causes the heart to beat harder and faster, if it be often repeated, will induce a thickening of the ventricles.

Treatment.—First, remove, as far as possible, all causes of excitement which produce palpitation. If the head is much affected, apply wet cups to the back of the neck. The same may be applied over the heart. This will generally improve the symptoms at once. A blister placed over the heart will likewise make a favorable impression.

The meals should be taken at regular intervals, and should be very light. The food should be plain and simple, and composed much more of vegetable than of animal food. In fact, the diet should be so spare as slightly to reduce the strength.

The patient should be careful never to take violent exercise, or, indeed to be in a hurry about anything. In bad cases, walking up hill, or against a strong wind, is often out of the question, and must in any case be attempted with great caution. Staircases are to be shunned as enemies. An attempt to run, even to avoid being left by the cars, might, in some cases, prove immediately fatal. Carriage-riding is not objectionable.

The passions must be held in the most thorough subjection. Excitements of all sorts are dangerous, and must be avoided.

For the first week or two of treatment, active purgatives will be useful. For this purpose, epsom salts and senna will answer a good purpose, and should be used so as to procure two or three watery stools a day.

In addition to this, some sedative to lessen the force of the heart's action is generally needed, especially when there is considerable palpitation. For this purpose, tincture of black cohosh, and tincture of scullcap, or the former with tincture of digitalis (285), (94), are quite useful. Three to ten drops of tincture of the American hellebore (*veratrum viride*) will reduce the action of the heart perhaps more effectually than any other medicine, for a few days or weeks.

Dilatation of the Ventricles.

THE several cavities of the heart hold about one and a half ounces each. Dilatation is simply an *enlargement* of these cavities, so that they will hold more. And this increase in the size of the cavity in simple dilatation is generally at the cost of the walls, which are made thinner and weaker,—just as the walls of a bladder are made thinner by blowing into it and increasing its internal dimensions.

Physical Signs.—Impulse more abrupt, and less marked than natural. Dull sound on percussion commensurate in extent with the dilatation. The first beat of the heart, clearer, louder, and shorter than natural, and more nearly resembling the second.

General Symptoms.—Difficulty of breathing; terrific dreams; starting from sleep; swelling of the feet and legs; purple, violet, or blue color of the cheeks, nose, lips, and especially around the eyes; feeble and oppressed palpitation; various disturbances in the head; bleeding from the nose, stomach, bowels, and womb; and frequently enlargement of the liver.

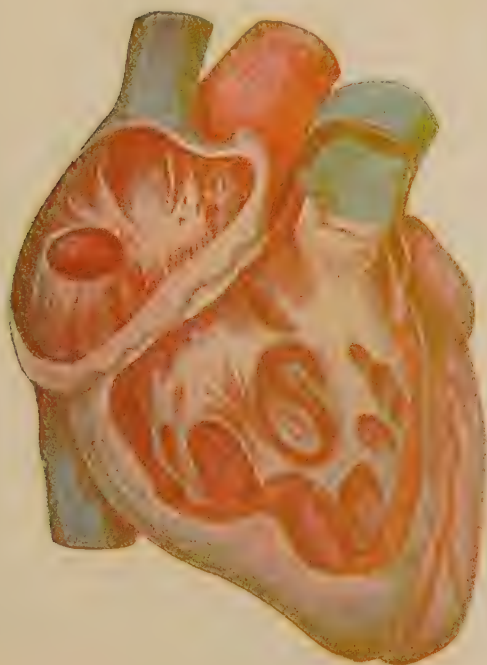
Explanations.—The first sound of the heart is short and not well marked, in consequence of the muscular walls of the ventricles in this disease being thin and in a weakened condition, so that every stroke they make is short, quick, and spasmodic, instead of strong and lifting, as in hypertrophy. For the same reason, the impulse is a brief blow dealt the walls of the chest, which gives a slight shock, but has not power enough to lift the chest up. The blow is quick, because the muscle is thin and can contract quicker than a thick one.

Dilatation, by thinning the walls of the cavities, enfeebles the heart, and shows us an obstructed circulation. Accordingly the blood is not transmitted by the left ventricle, and being retained in the lungs, it causes a crowded state of the vessels, and difficulty of breathing; also congestion of the brain, with terrific dreams, etc. And this engorgement of the lungs, being propagated backwards to the *right* heart, great veins, and all their ramifications, produces dropsy of the feet and legs, discoloration of the face, passive hemorrhages, and congestion of the brain, liver and membranes. Fig. 95 gives an idea of how all this happens.

Treatment.—As in many other diseases, search out the causes, and remove them. If it be obstruction of the circulation in the lungs by



INTERIOR OF THE LUNGS
SHOWING TRACHEA AND BRONCHIAL TUBES



INTERIOR OF THE HEART



FRONT VIEW OF THE STOMACH



bronchitis or other complaint, that needs the first attention. If it be caused by violent exercise, by strong emotions of the mind habitually indulged, or by drunkenness, or any other irregularity of life, these habits must be corrected without delay.

If it be caused by organic disease of the valves of the heart, relief cannot be so readily obtained; but even in these cases, it is to be sought and expected.

The circulation is to be kept as tranquil as possible by a strictly quiet and orderly life, and a plain, moderate, unstimulating diet. In this disease, however, it should be more nutritious, and composed to a larger extent of meats, than in hypertrophy.

In some cases the general health and tone of the system will need to be improved by bitters (50), (67), (64), (69), (79), mineral acids (60), iron (269), (61), and aromatics (115). The compound mixture of iron is a good preparation when this mineral is called for by a low state of the blood.

The stomach should be kept in the best possible condition, as a very small disturbance of it, even from acidity, will set the heart to beating very violently.

If hysterical symptoms are present, the compound galbanum pill, and valerian (97), and other *nervines* will be called for.

In attacks of great difficulty in breathing, immerse all the extremities in warm water, and throw a blanket around the patient to promote sweating, — at the same time admitting fresh air to satisfy the desire for breath. Give a draught, composed of ether, camphor, ammonia, etc. (135). This may be repeated two or three times, at intervals of half an hour, or an hour, according to the urgency of the case.

Hypertrophy with Slight Dilatation.

THIS is one of the most common complications of heart disease. It consists both in a thickening of the walls of the heart, and an enlargement of the cavities, — the former being more marked than the latter.

Physical Signs. — Both sounds are louder than in any other disease of the heart, and are heard sometimes over the whole chest. The impulse is strong and heaving, with an abrupt back-stroke. In bad cases, the whole person, and even the bed, is shaken by it. The dull sound on percussion covers a large space.

General Symptoms. — The same as those of the two diseases of which it is composed, slightly modified by the action of each upon the other.

Dilatation with Slight Hypertrophy.

THIS is an enlargement of the cavities of the heart, with a slight thickening of its walls; the dilatation being the predominant disease, or greater than hypertrophy.

Physical Signs.—Percussion gives a dull sound in the region of the heart, in proportion to its size. The first beat resembles the second. The second beat is louder than natural.

The impulse is a short, quick stroke, which contrasts strongly with the slower and heavier one of hypertrophy and dilatation.

The general symptoms and the treatment are a modification of those of the two disease united in it. It is, however, to be kept in mind that the dilatation takes the lead; and, furnishing the predominant symptoms, is specially to be regarded in the treatment.

Aneurismal Tumors of the Heart.

WHEN, from some obstruction in the valves, the blood cannot easily pass out of an auricle or a ventricle, its inner walls may become unable to bear the distending force, and giving way, let the blood through against the outer coats, which stretch, and swell out into the shape of a tumor,—the inside of the tumor becoming a regular *sac*. Such a state of things constitutes an aneurism of the heart. Of course it is a very grave disease.

Softening of the Heart.

IN this disease the substance of the heart becomes soft, and easily broken. It is generally the result of some form of inflammation.

Physical Signs.—The contractions of the heart being weakened by softening, the impulse is reduced in force, and both beats are weaker, and often they are intermittent. The first beat becomes short and flapping, like the second.

General Symptoms.—A quick, feeble, small, and faltering pulse, great anxiety, and a disposition to faint. General languor; a sallow, bloodless, withered complexion, with a purple, livid tint of the lips and cheeks, and frequently, general dropsy, from the inability of the heart to propel its contents.

Treatment.—When accompanied by acute inflammation, softening is to be treated on the same principles as inflammation of the heart-case.

If it be a result of chronic inflammation, it calls for iron, bitters, nutritious animal food, and good air.

Induration of the Heart.

THE muscular substance of the heart sometimes undergoes a hardening process. It is occasionally so much hardened as to sound, when struck, like a hollow horn vessel. The disease is rare.

It increases the heart's impulse, like hypertrophy; and it requires about the same treatment as that disease.

Fatty Degeneration of the Heart.

THE heart sometimes becomes overloaded with fat, which is deposited between the heart-case and the muscular substance, — covering the organ all over externally, and in some cases penetrating to some depth into its substance. The muscular walls themselves become thin and flabby.

Symptoms. — The sounds of the heart are diminished, — especially the first. The pulse is irregular. Pain, and a feeling of oppression in the region of the heart, with general signs of retarded circulation, such as congestion of the brain and liver. There is occasionally giddiness, loss of memory, and palpitation.

Treatment. — Exercise, mental excitement, and stimulating drinks must be avoided; and the patient must live for one or two years on a very light diet, taking but very little animal food.

Bony and Cartilaginous Productions in the Heart.

THESE productions in the heart are fortunately rare. Yet they occur; and the point of the heart, in its whole thickness, is sometimes changed to cartilage. The ventricles are sometimes so ossified as to resemble the bones of the head.

The symptoms of these degenerations are obscure; and as such cases are not curable, it is of less consequence that we should be able to know their precise nature during the life of the patient. The treatment can only afford temporary relief, and should be such as is prescribed in other heart-diseases with similar symptoms.

Shrinking of the Heart. — *Atrophy.*

THE heart, like any other muscle, is liable to defective nutrition, and in consequence of it may become small. It shrinks, in some cases, to the size of an infant's heart.

The complaint is generally caused by whatever reduces the general flesh, as consumption, diabetes, chronic dysentery, cancer, and excessive loss of blood.

It can hardly be called a disease. Persons who have it are less subject to inflammatory diseases than others, though they faint from slight causes, and have nervous affections.

Treatment. — If its causes can be discovered, treat them; if not the treatment should be the same as for dilatation.

Acute Inflammation of the Heart-Case. — *Pericarditis.*

THE pericardium, or heart-case, is a membranous sac, in which the heart is contained. It is composed of two layers. The outside

one is *fibrous*, dense and white; the inside one is *serous*. The serous layer forms the lining of the fibrous one, and then is reflected over the heart and the roots of the large blood-vessels.

When the pericardium becomes acutely inflamed, it throws out both lymph and serum or water. The lymph often causes the two layers of the sac to grow together.

Physical Signs. — The impulse is strong when the effusion of water is small, — feeble and unequal when it is large. Percussion yields a dull sound in proportion to the amount of fluid in the sac.

When listening with the stethoscope, a rough noise is heard, resembling either the rasping of wood, the grating of a nutmeg, the rustling of silk, or the crackling of parchment. Sometimes it is softer, like the blowing of a pair of bellows. Occasionally it resembles the creaking of a new shoe-sole, or has a low creaking, like the tearing of linen cloth.

When there is effusion, the ordinary beats of the heart sound dull and distant.

General Symptoms. — Acute inflammatory fever, generally preceded by chills, with pungent pain in the region of the heart, shooting to the left shoulder-blade, shoulder, and upper arm.

Pain increased by taking a full breath, by stretching the left side, by percussion, and by pressure between the ribs over the heart. Sometimes the pain is in the epigastrium, or left hypochondrium. Inability to lie on the left side.

Explanation. — The noises mentioned above are produced by the rubbing together of opposite surfaces of the heart-case, made rough by the exudation of lymph. The rasping is supposed to be caused by *firm* and *rugged* lymph; the rustling and creaking, by *soft* and *wet* lymph; the bellows murmur, by *soft* and *dry* lymph; the creaking, croaking, and crackling, by *dry*, *tough* lymph. These sounds may all be imitated by rubbing a damp finger upon the back of the hand, while listening with the stethoscope applied to the palm.

Chronic Inflammation of the Heart-Case.

WHEN acute pericarditis runs for more than ten days or a fortnight, it becomes *chronic*. It is chronic from the beginning, when it runs a slow, insidious course, without marked or violent symptoms.

The symptoms are much the same in kind with those of the acute form, only less in degree. This low grade of the symptoms of the disease renders it more obscure than the acute.

Treatment. — Move the bowels freely by an injection (247), or by a purgative pill (31).

The strength and amount of the remedies employed in each case must be in proportion to the vigor of the patient's constitution.

It is of great importance that the treatment should be active and prompt, and that the disease should be broken down *early*.

Diluent, cooling drinks (132), (129), (298), (299), should be allowed as freely as the patient desires, in order to dilute the blood, and render it less stimulating to the heart.

At the same time, five to fifteen-drop doses of tincture of veratrum viride should be given every hour, to bring down the action of the heart. Ten-drop doses of tincture of digitalis every four hours are good.

Let the diet be wholly of barley-water, thin gruel, weak tea, or arrow-root.

During recovery, the diet must be spare, and the greatest tranquillity of mind and body be preserved.

In the treatment of chronic cases, when the cavity appears to contain fluid, counter-irritation is suitable. Blisters, croton-oil, the compound tar-plaster, and especially the tincture of iodine. The diet may be a little more nutritious than in the acute form of the disease, — embracing light animal food and broths.

Inflammation of the Heart. — *Carditis*.

THIS is an inflammation of the muscular substance of the heart. When existing alone, it is a very rare disease. Being mixed up with other forms of heart disease, it does not require any separate account of its symptoms or treatment.

Acute Inflammation of the Lining of the Heart. *Endocarditis*.

THE heart is one of the citadels of life. Disease attacks it on all sides. In this complaint, it has entered the fort and taken possession. The inflammation is on the *lining* membrane.

Physical Signs. — The impulse is violent, abrupt and regular, as long as the circulation through the heart is free, but when this is impeded, it is at first a confused tumult (which generally happens when a fort is first taken), and gradually sinks to a feeble flutter.

The dull sound upon percussion covers a space of from three to seven square inches.

The beats of the heart are generally accompanied or marked by a bellows murmur, the loudness of which depends on the strength of the heart's action.

General Symptoms. — Inflammatory fever. The action of the heart being generally violent and abrupt, the pulse corresponds with it, and is strong, full and hard.

Explanation.—The bellows sound is supposed to depend on the inflamed and swollen condition of the valves.

The dullness on percussion will be slight when the circulation through the heart is free;—more distinct and marked when it is obstructed.

Dr. Hope says the disease may be anticipated, if a person be *suddenly* attacked with these three signs: namely, fever, violent action of the heart, and a murmur which did not exist before.

This disease, like inflammation of the heart-case, is often produced by, and is intimately connected with, acute rheumatism, and is then to be treated on same principles as rheumatic disorders.

Chronic Inflammation of the Heart's Lining.

Physical Signs.—The impulse more perceptible and diffused than natural.

The dull sound upon percussion covers a space of from four to eight square inches.

There is a sawing, rasping, or filing sound. This sound may cover one or both beats of the heart. Sometimes these unnatural sounds are double; in which case, the first is caused by an obstruction to the natural flow of the blood forward; the second, by the regurgitation or retrograde flow of the blood from some defect in the valve,—just as a pump-valve may get out of order, and allow the water which has gone through to flow back.

Explanation.—A variety of organic changes occur in the valves, which give rise to the murmurs. Inflammation of the lining membrane of the heart reaches the valves, causing puckering, thickening, vegetative, cartilaginous, bony and fat-like degenerations, which *obstruct* the blood in its onward flow, or prevent a closure of the valves, and allow it to flow back; the former causing the first sound, the latter the second. If the unnatural noise be synchronous with the first beat of the heart, it implies disease in either set of the semilunar valves, or an impossibility of closing the auriculo-ventricular openings; if it accompany the second beat, it signifies that either set of the semilunar valves may be open.

A murmur attending the first beat of the heart *must* be caused by a current of blood *from* a ventricle; one attending a second sound, by a like necessity, is produced by a current *into* a ventricle.

Treatment.—The same as that for pericarditis. It should be equally *prompt* and *vigorous*. It must not be forgotten that this disease leads to various organic diseases of the valves of a very grave character, and that such mischiefs can only be escaped by cutting the disease short in the very beginning.

Disease of the Semilunar Valves.

THE inflammation of the lining of the heart makes sad work with the valves. The semilunars are subject to various changes in their structure.

Physical Signs. — Obstructive Murmur. — In disease of the semilunars, the first beat of the heart is accompanied or obscured either by the bellows murmur, or a sawing, rasping, or filing sound. The unnatural murmur, whatever it is, appears *superficial* or *near*. The second beat is natural.

When the opening into the aorta is contracted, or in any way obstructed by unhealthy growths, so that the blood is subjected to more than a natural degree of *friction* in passing, this sound will be heard. It is called *obstructive*, because it arises from the obstruction of the blood in its *forward* course.

Regurgitant Murmurs. — First beat of heart natural. Second beat accompanied or replaced by bellows murmur. There is sometimes a musical murmur.

Explanation. — The regurgitant murmurs arise from the valves being too small, or defective in some way, and allowing the blood to flow back through the orifice.

This murmur is loudest opposite the semilunar valves, and is more audible *above* these valves than *below* them.

When the aortic valves are contracted or shortened, and the openings are not guarded by them, so as to prevent the backward passage of the blood, there is a *double* bellows murmur, — one when it is *driven through* the orifice, and another when it *flows back*.

Disease of the Mitral Valves.

Physical Signs. — Obstructive Murmur. — First beat of heart natural. Second beat accompanied or replaced by bellows murmur.

Regurgitant Murmurs. — The first beat of the heart accompanied by a loud and rough bellows murmur. This sound is like sawing or filing. It is loudest above or below the nipple, between the fourth and seventh ribs. There is occasionally a musical murmur. The second beat of the heart is natural. Sometimes there is a purring tremor.

General Symptoms of Valvular Disease. — Cough, in many cases with watery expectoration; difficulty of breathing; frightful dreams and starting from sleep; congestion of the lungs; expectoration stained with dark and grumous blood; swelling of the jugular veins; a livid look of the face; a feeling as if a cord were tied tight around the lower part of the chest; general dropsy, of the legs and feet in

particular; passive hemorrhages from the mucous membranes; engorgement of the liver and spleen; congestion of the brain, with feelings of oppression. When the mitral valve is contracted, admitting regurgitation, the pulse is small, weak, irregular and intermittent.

These are the worst symptoms of an advanced stage.

Explanations. — The examiner will distinguish the various sounds thus:

The murmurs generated at the origin of the arteries spread their sonorous currents *upwards along these arteries*.

Those produced in the auricular orifices will be conducted into the auricles, and propagated *downwards towards the apex of the heart*.

Which Set of Valves. — To learn in which set of valves it originates, therefore, find its seat, and *trace its direction*.

Finding the murmur to be in the *aortic orifice*, it is then known to be *obstructive*, if the first sound is morbid, and the second sound natural; and *regurgitant*, if the first sound is natural, and the second sound morbid.

But if the murmur be in the mitral orifice, it is *obstructive when the first beat of the heart is natural, and the second beat morbid; and regurgitant when the first beat is morbid and the second beat natural*.

The Pitch or Key of a murmur depends on the distance of its seat from the ear of the listener, — *nearness giving a high, and distance a low key*. Thus, a murmur seated in the orifice of the pulmonary artery, being *nearer* the surface, has a *higher pitch* than any other. It is on about the same key with a whispered s, — sometimes a little lower, and depending somewhat on the *strength* of the current of blood, *a strong current elevating, and a weak current depressing the tone*.

The mitral orifice is situated opposite the junction of the cartilage of the third rib with the left side of the breast-bone. The aortic orifice is about half an inch to the right of this, and the same distance lower. It is known by the key being lower, — about like a whispered r, which is the ordinary type of the sawing sound.

Murmurs from pulmonic and aortic *regurgitations* are about two tones lower, in consequence of the currents of the blood being weaker. They are like whispering *awe* by *inspiration* and if the click of the valve be heard, the sound will be changed to *paw*.

Murmurs in the mitral valve, being more deeply seated, are about four tones lower, and are like a whispered *who*.

The tricuspid murmurs are higher than the mitral, because nearer the surface.

The musical murmur has been compared to whistling, the cooing of a dove, and the mewling of a kitten. It generally results from regurgitation.

The purring tremor is caused, generally, by regurgitation through the mitral valve.

Other Symptoms Explained. — The difficulty of breathing, frightful dreams, congestion of the lungs, hemorrhages, engorgements, etc., mentioned above, all proceed from such valvular stiffenings, puckeringings, ossifications, enlargements, and contractions, as occasion a decidedly *obstructed* circulation.

The small, weak, irregular, and interrupted pulse, is caused by contraction of the mitral valve, which occasions an insufficient or irregular supply of blood to the ventricle, and causes the ventricle, by losing the resistance of the valve, to expend its force in a backward as well as a forward direction, thus sending but little blood into the arteries.

Treatment.—The great object of treatment is to diminish the force and activity of the circulation,—to induce the heart to cease striving to do what cannot be done.

To accomplish this, give sedatives (285), (94), (124). The hellebore and cohosh will be found particularly serviceable.

The tincture of the American hellebore is about the best of all. Purgatives may be given according to the strength of the patient.

When there is dropsy, and a scanty secretion of high-colored urine, diuretics, or medicines to increase the action of the kidneys, are very important. For this purpose, digitalis and acetate of potash (130) are excellent. Should this not succeed in reducing the dropsy, an active purgative (31) may accompany it.

A remedy which comes in powder form called diuretin, given in 20 grain doses dissolved in water every four hours for one or two days exerts a favorable influence in many cases. If no improvement has been noticed at the end of two days the remedy may be discontinued, but it has worked so satisfactory in a large per cent. of cases that its use is justified.

Diaphoretics, or medicines which promote perspiration, are also useful.

The diet should be unstimulating, and yet should be sufficiently nourishing to prevent the patient from running too low. Animal food of the most digestible kind may be taken once a day; though there are many cases requiring its entire rejection.

The passions should be kept in the most perfect subjection, and *the life should be as tranquil as possible. Nothing must be done in a hurry.*

Water in the Heart-Case. — *Hydropericardium.*

THIS disease is common as an attendant of general dropsy.

Physical Signs. — The impulse is undulatory, as if transmitted through a fluid, and it is not always of the same strength.

The dullness extends upward in a conical form, in proportion to

the amount of fluid, — sometimes rising as high as the second rib. The impulse does not coincide with the first beat of the heart.

General Symptoms. — The patient has a *sensation of the heart being in a floating state*. The pulse is small, frequent, and intermittent.

Explanation. — The reason that the impulse does not occur at the same time with the first beat of the heart is, that the apex does not *immediately* strike the walls of the chest, — some time being required to push it up through the fluid.

The beats of the heart sound more distant than natural in consequence of the organ being pushed away from the walls of the chest by the fluid and the impulse will be noticed in the usual place namely, inside the nipple line between the fifth and sixth rib spaces, but the intensity of the sound will be lessened. The position is in a different place; in dilatation of the heart, when the impulse more or less faint will be noticed far to the left of the nipple line.

Palpitation. — Nervous Palpitation. — Anæmic Palpitation.

THERE is a great deal of palpitation of the heart dependent on dyspepsia, hypochondria, hysterics, mental agitation, excessive study with deficient sleep, venereal excesses, and masturbation.

Palpitations likewise occur from what is called *anæmia*, or a low and deficient state of the blood.

Physical Signs. — The impulse is weak, fluttering, or tumultuous, — generally increased by trifles.

The beats of the heart are increased in frequency, and sometimes marked by intermission. Now and then they are accompanied by a bellows murmur. There are musical murmurs in the jugular veins, — loudest a little above the collar-bones.

General Symptoms. — The complexion is generally pallid and bloodless; the lips and the inside of the mouth partaking of the same paleness; the pulse quick, small, weak, and jerking; and during palpitation it sometimes has a thrill. Slight causes produce breathlessness and faintness. A dislike of animal food, and a fondness for acids. The monthly discharge in females is deficient, and the whites take its place. Sometimes the menses are too profuse, lasting for several days, and consisting only of blood. In this state of things there is great feebleness both of mind and body, with rushing noises in the ears.

Explanations. — The murmurs depend on a lack of blood. The conditions of their existence are, thinness of blood, a swift and spasmodic circulation, and particularly an unfilled condition of the blood-vessels. A brook is the more babbling in proportion as its water is more shallow. It is a law in physics, that heaviness of freight gives

steadiness of motion; and lightness of freight gives unsteady motion. The fireman's hose trembles and vibrates when only half full of water. In like manner the blood-vessels are agitated when imperfectly filled.

Treatment: — This is to be governed altogether by the cause of the trouble. If it be dyspepsia, hypochondria, hysterics, etc., these several diseases require their usual treatment; when they are cured, the palpitation will stop.

A very good treatment for this disorder is a teaspoonful of the following mixture given three or four times a day with water:

Tincture of aconite	fifteen (15) drops.
Tincture of nux vomica	three (3) drachms.
Compound elixir of gentian with iron	three (3) ounces.

But when it is caused by a low state of the blood, then give for several weeks, iron, the compound mixture, and (316), (310).

The food must likewise be nourishing, — tender meat, beef and mutton, with broths, etc.

Gentle exercise will be required, and much exposure to a bracing out-door air.

Neuralgia of the Heart. — *Angina Pectoris*.

THIS is a strictly nervous disease. It begins with a sensation of pain and constriction in the region of the heart. This pain is accompanied with more or less pain and numbness in the left arm. In females it is not uncommon for it to be attended by great sensitiveness and pain of the breasts. When the attack is violent, the pain in the heart is excruciating, and even terrific. There is attending this a feeling of great oppression in the chest, amounting, in the worst cases, to a sense of suffocation. The heart palpitates violently, the brain is oppressed, and fainting sometimes occurs.

The disease is brought on, in nervous subjects, by over-excitement of the heart. Walking up hill, against a strong wind, may bring it on. If walking at the time of the attack, the patient is compelled to stop, and stand still till the pain subsides.

The disease is often connected with organic changes in the heart's structure, such as ossifications and other alterations.

Treatment. — When the complaint depends on organic disease of the heart, the treatment must be directed to the cure of these diseases.

To relieve a severe attack, the patient should be instantly placed in a quiet position; wind in the stomach, if present, should be expelled by peppermint or anise water, or ether, or (115), or some other aromatic. If there is acidity or sourness of the stomach, it must be corrected by a teaspoonful of soda in half a tumbler of water; and if the stomach be full of undigested food, let the patient take a table-spoonful of ground mustard, stirred up with a teacupful of warm water. This will cause almost instant vomiting.

These things being done, give some quieting or antispasmodic medicines, or one of the following prescriptions: (285), (97), (135), (124). Inhale 5 drops of nitrite of amyl on a cloth frequently.

Great relief is often obtained by sending a current of magnetism through the region of the heart, by applying one pole of the machine in front, and the other upon the back.

During the intervals, the general health is to be improved by a wholesome, nourishing diet, gentle out-door exercise, and a careful control of all the passions. $\frac{1}{100}$ of a grain of nitro-glycerine every hour, while in pain, steadies and slows the heart.

Polypus of the Heart.

A PORTION of the fibrin sometimes separates from the blood in the heart and large vessels, and becoming more or less organized, forms polypuses, which fill the cavities to which they are attached, and seriously obstruct the circulation.

Physical Signs.—When the pulsations of the heart, previously regular, become suddenly anomalous, confused, and obscure, so that they cannot be analyzed, we may suspect a polypus.

General Symptoms.—A sudden and great aggravation of the bad breathing, without any visible cause,—the patient being in agony from a sense of impending suffocation, and tossing about from side to side, struggling for breath. The pulse small, weak, irregular, intermittent, and unequal; the surface and extremities cold; the face, livid,—to which there is generally added nausea and vomiting.

Treatment.—When the polypus is once formed, the case is hopeless. The treatment, therefore, can only be preventive.

The chief things to be done are, to keep the patient in a state of entire tranquillity, and to bring the circulation to the surface, by keeping the skin warm, and excited by friction. This will call the blood away from the heart and great vessels. and lessen the chances of the polypus.

Displacements of the Heart.

THE heart may be misplaced from birth. I have seen a case in which it lay upon the right side, and had always been in that position. Its action was natural.

A variety of causes may tend to push it out of its place, as water in the cavity of the pleura. In such cases, it will return to its place when the water is drawn off or absorbed.

DISEASES
OF THE
ABDOMINAL CAVITY

DISEASES OF THE ABDOMINAL CAVITY.

UNDER the above head I shall consider most of the diseases which occur in the great cavity below the diaphragm, called the abdomen or belly. These affections are quite important, and make up a considerable part of the ills we suffer from disease.

Before speaking of these diseases, however, I will call the reader's attention to a profile view of the relative position of the several organs lodged in this cavity.

In Fig. 96, L is the *liver*, S the *stomach*, C the *colon*, R the *rectum*, B the *bladder*, P D the *pancreas*, and I the *intestines*. The double lines, folded back upon each other, and surrounding most of the organs, represent the *peritoneum*, a membrane which lines the great cavity of which I am speaking.

It will be well, too, before proceeding further, to make the reader acquainted with the names of certain *regions* of the abdomen which he will find constantly spoken of in medical books. I have not used these terms much in my book; but it will be convenient to be acquainted with them. Physicians who are careless in their readings are not always familiar with their exact locality.

In Fig. 97, the abdomen is divided into nine different regions by the drawing of two parallel lines up and down, 2, 2, and 3, 3, and two lines across, 4, 4, and 1, 1. This gives three regions above, three in the middle, and three below.

In the upper row, 6 is the *epigastrium* or *epigastric region*, in which are the left lobe of the liver, and a portion of the stomach; 5, on the



FIG. 96.

right side, is the *right hypochondrium*, in which is the right lobe of the liver; and 5, on the left side, is the *left hypochondrium*, which contains the spleen, and a portion of the stomach and liver.

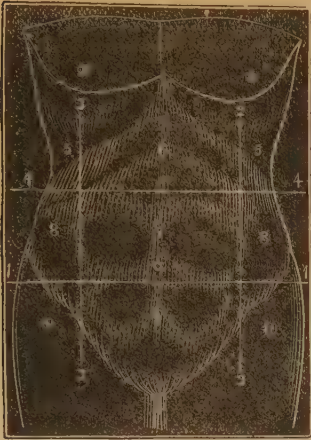


FIG. 97.

In the middle row, 7 is the *umbilical region*, which contains the small intestines. On the right side, 8 is the *right lumbar region*, which holds the right kidney and the ascending colon; and 8, on the left, is the *left lumbar region*, which contains the left kidney and the descending colon.

In the lower row, 9 is the *hypogastric* or *hypogastric region*, which contains a portion of the small intestines and bladder. On the right, 10 is the *right iliac fossa*, containing the *cæcum* or *caput coli*; and 10, on the left, is the *left iliac fossa*, containing the sigmoid flexure.

And now I may as well present, in Fig. 98, a front view of many of the organs, both in the chest and abdomen: 1, 1, 1, 1, are the muscles of the chest; 2, 2, 2, 2, the ribs; 3, 3, 3, the upper, middle, and lower lobes of the right lung; 4, 4, the lobes of the left lung; 5, the right ventricle of the heart; 6, the left ventricle; 7, the right auricle of the heart; 8, the left auricle; 9, the pulmonary artery; 10, the aorta; 11, the vena cava descendens; 12, the windpipe; 13, œsophagus; 14, 14, 14, 14, the pleura; 15, 15, 15, the diaphragm; 16, 16, the right and left lobes of the liver; 17, the gall-bladder; 18, stomach; 26, the spleen; 19, 19, the duodenum; 20, the ascending colon; 24, the transverse colon; 25, the descending colon; 22, 22, 22, 22, the small intestines; 23, 23, the

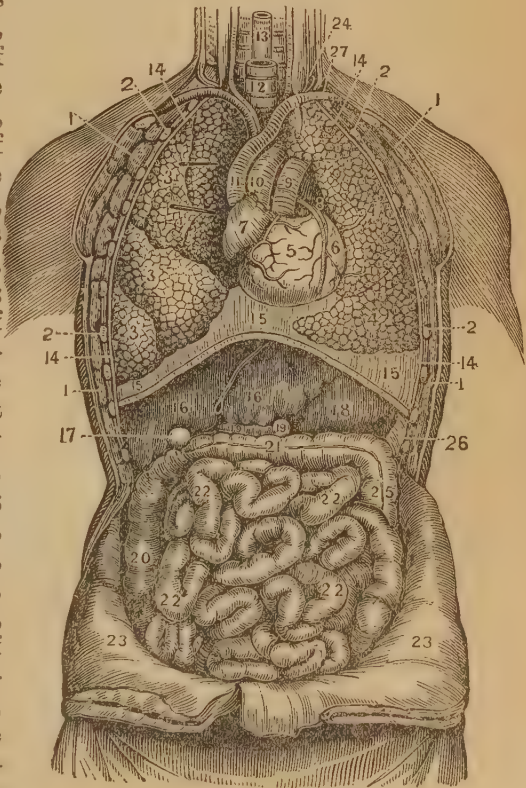


FIG. 98.

walls of the belly turned down; 24, the thoracic duct, opening into the left subclavian vein (27).

Acute Inflammation of the Liver. — *Hepatitis.*

THE liver is the largest gland in the body. (See Fig. 31.) It lies in the right side, and at the top of the great abdominal cavity, directly under the midriff, and lapping upon the stomach. Fig. 96 shows its relative position. Its office was supposed to be to take the superabundant carbon out of the blood. This carbon it unites with other elements and forms bile, the peculiar bitter substance which is poured into the upper bowel, and greatly aids digestion.

The liver is liable to become inflamed from several causes, such as gravel-stones, external violence, suppressed secretions, hot climates, inflammation of the duodenum, etc.

Symptoms. — These are sympathetic fever, with pain, and a sense of tension in the right side, inability to lie on the left side, difficulty of breathing, a dry cough, vomiting, and hiccup.

The pain is acute and lancinating generally, though sometimes dull and tensive. When sharp, it is like the stitch of pleurisy, and it indicates that the peritoneum which covers the liver is inflamed. When dull, it is the body of the organ which is suffering. When the convex surface of the liver is the seat of the disease, the pain is apt to run up to the right collar-bone, and to the top of the right shoulder. Breathing, coughing, and lying on the left side, increase the pain. A soreness is felt by pressing over the liver. The pulse is full, hard, and strong, the bowels are costive, and the stools are clay-colored, owing to not being tinged with bile,—this having stopped flowing. The tongue is covered with a yellow, dark brown, or even black coat, and there is a bitter taste in the mouth.

Explanation. — The bile, secreted by the liver, is poured into the upper bowel, and gives the brown or yellow color to the contents of the bowels. When the liver is inflamed, it cannot work,—it secretes little or no bile, and the discharges from the bowels lose their color. The bile is slightly laxative, and when it ceases to flow into the bowels, they become bound or costive. When the liver does not work, the bile has to be taken out of the blood by the kidneys, and the urine becomes of a deep yellow color. Much of it goes out through the skin, too, which is likewise yellow, and the sweat becomes so yellow as to stain the linen.

Treatment. — Flax-seed poultices applied over the liver are very good. Purgatives will also need to be used pretty freely at first. Those which produce watery stools (31), (247), (34), will be of the greatest service.

Or, in the milder cases, a mustard poultice may be applied over the whole side, and even along the spine.

Frictions over the stomach and liver with dilute nitro-muriatic acid, and a foot-bath of the same, will sometimes do well. The acid should be reduced with water to about the strength of sharp vinegar. Water a little soured with this same acid makes an excellent drink for the patient.

Perspiration should be induced by the spirit vapor-bath, and kept up gently by the tincture of the American hellebore, from three to ten drops every hour. Or, the same thing may be done by prescriptions (126), (358).

When the urine is small in quantity and red, give some diuretic, as infusion of marshmallow-root, pumpkin-seeds, or trailing arbutus.

The diet should be rice-water, gruel, and toast-water. While getting up, it may gradually be improved, and some light tonics (49), (58), (64) be added to it.

Chronic Inflammation of the Liver. — *Chronic Hepatitis.*

THERE are few chronic diseases for which the physician is more often consulted than this. In the warm climate of the South, in the bilious districts of the West, and indeed even in the Middle and Eastern States, it meets us continually, and demands our attention. That it is difficult to cure must be admitted; but a constant familiarity with chronic diseases, for several years, has convinced me that it is generally curable.

Symptoms. — A sense of fulness and weight in the right side with some enlargement, and shooting pains felt in the same region, particularly when it is pressed, with pains in one or both shoulders, and under the shoulder-blades; uncomfortable sensations when lying on the left side; yellowness of the skin, eyes, and urine; bowels irregular, loose, or costive; appetite disturbed; sometimes a dry, hacking cough; shortness of breath; tongue whitish, and brown or yellow towards the root; a bitter and bad taste in the mouth in the morning. The urine deposits a sediment on standing. There is generally a low and desponding state of mind, with irritability and peevishness of temper.

The skin is often covered with yellow spots and with a branny substance. The various symptoms of dyspepsia are often present. The nervous system is generally much disturbed, and there is a disinclination to apply the mind. There is frequently a great dread of imagined evil, supposed to be impending.

Treatment. — This does not require to be as active as that for the acute form of the disease.

If there be much tenderness of the liver, begin with mustard poultices, and the compound pills of podophyllin, or the compound pills of leptandrin, or (36).

I have abandoned the use of mercury in this disease, as in most others; but if any prefer to use it, the blue pill (52) will be found the most useful form.

The compound tar-plaster placed over the liver, in bad cases, is often very serviceable.

An alterative (138), (146) will be found useful.

The daily alkaline sponge-bath must on no account be omitted. Vigorous friction must follow it. Vigorous constitutions will bear the shower-bath; in such cases it may, occasionally, take the place of the sponge-bath.

The diet must be simple, yet nourishing and wholesome, and embracing but a small amount of fat, as this is composed largely of carbon, and the liver is unable to remove what is already in the blood.

Especially and above all, out-door exercise must be taken to the full amount of the strength, and the thoughts be occupied with cheerful subjects. Let the hot sun be avoided, and the summer exercise be taken in the cool hours of the day.

The recovery from this, as from all other chronic diseases, must necessarily be slow.

Congestion of the Liver.

THIS is not strictly a disease, but the result of gastro-intestinal disorders. There is an enlarged, congested liver, with a sense of fulness and weight in the right side under the ribs.

The application of heat, and even leeches, to the side, and the administration of saline laxatives, afford relief. The diet must be light and farinaceous.

Passive Congestion of the Liver

RESULTS from mechanical obstruction to the outflow of blood from the liver. When this condition has existed some time, there is a sense of weight and fullness in the liver region when sitting up or lying on the left side. The liver is enlarged and tender; the breath is shortened, and pain may be present, extending to the shoulder.

Jaundice is usually present, but only to a slight degree. When the heart is the cause of the obstruction to the outflow of blood, there is often present an associated gastro-duodenal catarrh, in which case loss of appetite, nausea, vomiting, belching of gas, and pain, are also present. In the later stages of a prolonged case, ascites, or dropsy of the peritoneal cavity, is present.

Prognosis.—The outcome of passive congestion of the liver is usually grave, since it is the result of some structural disease elsewhere, as of the heart, asthma, chronic pleurisy, tumors, etc.

Treatment. — The indications for treatment are to strengthen the heart with digitalis, strophanthus, etc., increase the strength of the patient with strong, stimulating food, and to deplete the portal circulation by vegetable laxatives like podophyllin, rhubarb, aloes, etc.; the salines also furnish an agreeable method of depletion, as for instance, Crab-orchard water, Hunjadi, etc. It occurs usually after middle life, and is more common in women than men. It is usually secondary to other diseases, as in the bowels or stomach, rectum and womb. The liver is increased in size, and is frequently studded with smallish nodules, which in well-marked cases may be felt through the abdominal wall.

The disease usually gives rise to loss of appetite, nausea, vomiting, constipation, emaciation and weakness. Pain over the liver is generally present, while jaundice exists in about fifty per cent of cases. Dropsy of the bowels exists likewise in about the same proportion of cases. Hemorrhages from the nose, stomach and bowels occur in the later stages of the disease. The temperature is usually lower than normal, and the pulse slow, especially if jaundice be present; the urine is diminished in amount and high colored. The disease progressively advances to a fatal termination inside of a year. No known treatment is of avail in arresting the terrible malady.

Cirrhosis of the Liver.

THIS is a disease characterized by an excessive increase of the fibrous tissue in the liver, whose later function is to contract and squeeze out, so to speak, the softer, glandular structure of the liver proper, thus causing its atrophy and diminution in size. The disease is caused mainly by the introduction into the portal system of some irritant like alcohol. It is generally known as the gin-drinker's liver, but it does not result especially from gin any more than from any other spirit. It is, at all events, essentially a disease due to prolonged though moderate use of spirits of one sort or another, and occurs between the ages of thirty and sixty, mostly in men.

The symptoms of this disease are at first those of gastric and intestinal disorders due to alcohol, as nausea, flatulence, constipation and looseness, etc.

Dropsy is finally the most pronounced symptom of the disease, but hemorrhages from the bowels not infrequently occur. The distension of the abdomen by dropsy is sometimes enormous; finally the feet and legs become swollen, emaciation and weakness progress, and the patient may finally die in coma or convulsions. The disease, when sufficiently advanced to be recognized, is incurable.

Treatment. — The treatment is to be directed toward the removal of all irritating food and alcohol. The diet should consist largely of milk; green vegetables and fruit, beans, peas, eggs, lean meat, etc., may be taken if well borne.

The stomach and bowels are to be kept in good condition, the dropsy drawn off or removed by means of loose evacuations from the bowels.

Hydrochloric acid in three-drop doses, well diluted, after meals, may be of service, while bitter stomach-tonics are to be given before eating.

Acute Inflammation of the Spleen. — *Splenitis*.

THE spleen is in the upper part of the belly, on the left side, opposite the liver. It is subject to acute inflammation, which is known by a pain just under the short ribs on the left side, also by swelling, soreness to the touch, and by more or less fever. The pain often shoots up through the midriff and to the left shoulder. There is a short, dry cough; a feeling of tightness about the heart; a sickness at the stomach, and vomiting; and a discharge frequently of black blood from the bowels. The urine is scanty, is passed with some difficulty, and is high-colored.

This disease appears most frequently in hot climates, and is often connected with intermittent fevers.

Chronic Inflammation of the Spleen.

THIS prevails most in fever-and-ague districts, and is a frequent result of chills and fever. It is generally very stubborn, often lasting many years.

Symptoms. — A feeling of weight, tightness, and sometimes pain in the left side, the pain being increased by pressure, or an attempt to lie on the left side. The organ sometimes enlarges very much, so that it can be felt by the hand. This enlarged mass passes under the common name of “ague cake.” There are sometimes numbness, weakness of the legs, difficulty of breathing, palpitation of the heart, inability to exercise much, obstinate constipation, vomiting of food, piles, dry skin, tongue coated white or red, low spirits, and occasionally dropsical affections.

During the chill in fever and ague, the spleen becomes enormously loaded with blood. Surfeited and stretched in this way again and again, it is not strange that the organ should become diseased.

Treatment. — This should be about the same as the treatment for acute and chronic inflammation of the liver.

After the active symptoms of inflammation are subdued, the warm bath may be used one or twice a week.

In the chronic form of the disease, counter-irritation with the compound tar-plaster, with mustard poultices, croton-oil, or tincture of iodine, will be particularly needed.

Among medicines, muriate of ammonia (53), has a high reputation.

To keep the bowels open, podophyllin, quinine, and nux vomica (46), have a fine effect. Iron may be given (73) when the patient is bloodless and pale.

Jaundice. — *Icterus*.

THE jaundice is a very common disease, and to be known needs only to be seen; but inasmuch as it may be but a symptom rather than a disease *per se*, it behooves one to be careful that some hidden disorder be not preying upon the system. Among the more common affections which give rise to jaundice are gastro-duodenal catarrh, frequently affecting children, obstruction of the gall-ducts by thick bile or mucus, or by gall-stones; cancer, chronic forms of liver complaints, and some forms of blood diseases.

Symptoms.—The most prominent symptoms are, yellowness of the skin and whites of the eyes, saffron-colored urine, and whitish or clay-colored stools. So full is the urine of bile, that a piece of white linen dropped into it receives a bright yellow tinge.

Besides these symptoms, there are impaired appetite, a loathing of food, the sense of a load at the pit of the stomach, sourness of stomach, sometimes sickness and vomiting, a bitter taste in the mouth, disinclination to move about, sleepiness, a dull pain in the right side, which is increased by pressure.

The entire body of a person who has died of jaundice, including bones, muscles, and membranes, are found to be full of bile, and colored yellow.

Explanation.—The bile flows into the upper bowel, a little below the stomach, through a duct or tube about as large as a goose-quill. This little tube or vessel receives the bile from a smaller tube, called the hepatic duct, and from another which goes to the gall-bladder, called the cystic duct.

These little tubes sometimes get obstructed or plugged up by sticky, thickened, or hardened bile, or by gall-stones, formed in the liver; and the bile, finding no outlet through its natural channels, is taken up by the absorbents, distributed over the system, and produces the yellowness we witness. When these ducts and the gall-bladder are filled and stretched by this thickened and hardened bile, they become tender and sore. Hence the sore feeling in the side when pressure is made.

There is another explanation of the way in which the yellowness of jaundice is produced, and it matters not whether it or the one just given be adopted. It is this: The bile is formed by the blood, and not by the liver. The office of the liver is to draw or strain off the bile from the blood. And when this organ is inflamed, or gets sluggish and will not work, the blood is not relieved of its yellow freight. The bile accumulates, and in attempting to escape through other channels, it lodges in the various tissues, particularly in the skin.

Treatment.—An infusion of thoroughwort, drunk freely every day, is a valuable remedy. The inner bark of the barberry steeped in cider, or this article compounded with others (286), (287), will be found excellent.

The diet should be plain, wholesome, and nourishing, but composed mostly of vegetable articles, particularly green vegetables and berries when they are to be had.

Cold water should be the principal drink; or drink and medicine may be combined in the shape of three drops of muriatic acid, and two drops of nitric acid, dissolved in a tumbler of water slightly sweetened. This is generally a pleasant drink, and will assist very much in the cure.

The warm bath once or twice a week, and the alkaline sponge-bath every day, with smart friction, must not be omitted.

When jaundice is caused by the passage of gall-stones through the bile-duct, there is sometimes terrible pain and suffering,—the stone, occasionally, being as large as a nutmeg, and forcing its way through a quill-sized tube. So great is the distress that the patient sometimes rolls upon the floor in agony. To alleviate this pain, large doses of opium, laudanum, or morphine, are required. A large teaspoonful of bicarbonate of soda dissolved in a tumblerful of hot water is an excellent remedy if drunk at a single draught. It relieves the acidity of the stomach, and acts as a fomentation to the internal seat of the pain. Mustard poultices, or warm fomentations, over the seat of the pain, are required. The warm bath is excellent.

The acid bath, made by mixing three parts of muriatic acid with two parts of nitric acid, and adding as much of this mixture to water as will make it about as sour as weak vinegar, is valuable in jaundice. Only a quart of water need be taken; and the solution should be applied with a sponge. It is of the right strength, if it produce a slight tingling of the skin.

Gall-Stones.—*Biliary Calculi.*

These are brownish, chocolate-colored concretions which form either in the gall-bladder itself, in the duct leading from the gall-bladder, or in the common duct which is formed by the union of the gall-duct and the hepatic duct which leads from the liver. They are solid, generally have bodies of irregular shape and size, and have facets caused by the stones being impacted against one another. Fig. 99 shows their appearance. These concretions are formed of inspissated bile and organic salts. When they settle into the ducts their natural course is downward through the duct into the bowel, where they are naturally carried off with the fæces. Their passage through these ducts is accompanied often with extreme pain and colic, the pain being the severest of any to which the system is subjected, and generally requires an opiate. When once an *attack* of



FIG. 99.

gall-stones has occurred, the patient is liable to more, as they seldom exist singly in the gall-bladder. These repeated attacks have been the subject of a great deal of thought among surgeons.

Symptoms.—An almost constant uneasiness in the right hypochondriac region, with spasms of pain, coming on suddenly, and lasting for a time with great severity, and then subsiding. The pain is caused by a stone being suddenly forced into the duct and moving forward in it, and it subsides when the stone either stops, or gets through the duct. When the stone reaches the bowels, it passes off with the stools.

The patient generally has a pale, sallow complexion, a small, feeble pulse, and often suffers from nausea and vomiting, and from restlessness and hurried breathing.

Treatment.—To reduce the spasm, give Dover's powder in full doses, or chlorodine. Also, apply mustard over the right hypochondrium and stomach, and follow it with hot fomentations with hops.

If the stomach is irritable, give the neutralizing mixture until it moves the bowels. To relieve the intense pain, morphine should be administered, together with hot baths and hot cloths over the abdomen.

Sweet oil was at one time advocated as a solvent of these bodies, but experience has not proven the validity of the claim. Many practitioners, however, still insist that oil in large doses hastens the passage of the stones.

To remove the acidity on which the formation of these stones so often depends, a neutralizing preparation (338) may be given for a long time, the diet, in the mean time, being well regulated. The sponge-bath with saleratus and water, should be taken daily, followed by brisk rubbing; and free exercise in the open air should on no account be omitted.

Of late years it is customary to treat this complaint surgically, operating directly on the gall-bladder by incising it and removing the stones. If the ducts become obstructed, they too are incised and the stones dislodged, either by pushing them down into the bowel, or otherwise, as may be most convenient. The gall-bladder is either sutured to the abdominal wall, and a biliary fistula forms, discharging the bile upon the abdominal wall; or it may be drained off into a bottle; or, as has been recently advocated, the bladder may be sewn up tightly and replaced. Sometimes communication is established between the gall-bladder, or the duct, and the duodenum, by means of an ingenious device called "Murphy's Button." This button, invented by Dr. Murphy of Chicago, is intended to draw together the parts to be connected, retaining them in that position. After some days the walls slough away, and the button passes into the bowel, and is thus removed from the system. By this means

many stubborn cases of impacted gall-stone have been permanently cured.

Abscess of the gall-bladder, inflammation of the surrounding tissue, and even death are not infrequent results of the presence of these foreign bodies.

For preventing the formation of gall-stones, see the articles on Bilicousness, Diet, etc.

Acute Inflammation of the Stomach. — Gastritis.

THIS is a rare disease. It is generally induced by irritating and corrosive substances taken into the stomach. Poisons, as arsenic, aquafortis, corrosive sublimate, and the like, are the most common causes of it. Blows, sudden stoppage of sweat, and excessive use of ardent spirits, may also excite it.

Symptoms. — It is marked by burning pain in the stomach, thirst, restlessness, anxiety, constant vomiting, prostration of strength, a quick, hard, and small pulse, incessant retching, a sunken countenance, hiccough, cold hands and feet, and a damp skin.

Treatment. — If the inflammation be excited by poison, the remedies named under antidotes for poisons must be first employed.

The poison being neutralized or thrown off, the inflammatory condition must be combatted with the remedies usual for such states. Mustard poultices to the feet, along the spine, and particularly over the pit of the stomach, will be among the first things to be employed, and should be followed by hot fomentations of stramonium leaves or hops, — both the fomentations and the poultices to be repeated as occasion may require. Repeated doses of bismuth, or $\frac{1}{8}$ -grain doses of cocaine, are generally very soothing to the stomach, and relieve the terrible vomiting.

Drinks. — Cold water, bread-water, rice-water, arrow-root gruel, infusion of slippery-elm bark, and of marshmallow. These should be taken in very small quantities, — say a teaspoonful at a time, — about twenty drops of tincture of aconite-root being added to a half tumblerful. Lumps of ice may be held in the mouth, and occasionally swallowed.

Injections. — Emetics and physic are not proper, but injections (248), (253), or simply soap-suds, will be required.

The remedies must be pursued until all tenderness has disappeared from the pit of the stomach.

While the patient is recovering, great care must be taken not to overload the stomach with food. Arrow-root, sago, and milk are among the first articles to be allowed. After these, will come gradually beef-tea, chicken-broth, soft-boiled eggs, and beef-steak, until the whole diet can be restored.

Chronic Inflammation of the Stomach.

THIS is a much more common disease than the preceding; indeed it is very common. Though it does not put life in immediate danger, it perverts the feelings of the stomach, and causes many of the symptoms of indigestion. Dyspepsia, however, is a different complaint, and not necessarily connected with inflammation.

Symptoms.—There is generally pain in the stomach, which is increased by the presence of food, and by external pressure. The pain is sometimes felt only during digestion. The fermentation of the food in the stomach generates a gas, which is frequently belched up. This is what is meant in common language by having “wind in the stomach,” and “belching wind.” The meals are frequently vomited up; the appetite is fickle, sometimes voracious, and again nearly absent; the thirst is likewise variant; the tongue is white in the centre, and red at the sides and tip,—sometimes smooth and red all over, like a slice of raw beef. The urine is scanty and high-colored.

The disease is very liable, if badly managed, to lead to ulceration of the coats of the stomach, and thence to a fatal end; for an ulcer may penetrate the walls of the stomach, and let its contents into the abdominal cavity, which would excite an immediately fatal inflammation.

Treatment.—If there be tenderness, counter-irritation will answer,—as mustard poultices, or the compound tar-plasters.

The skin of the whole surface should receive special attention. The warm or the cold bath should be used often, according to the strength of the patient. When the reaction is good, a cold compress bound upon the stomach every night, will do much to bring relief.

The diet cannot be too carefully managed. While there is considerable tenderness, the nourishment must be of the most simple and unirritating kind,—consisting of little more than the most bland nutritive drinks; and even these should be taken in small quantities at a time. Gum arabic water, rice-water, barley-water, arrow-root, gruel, tea, and toast without butter, will be amply sufficient to keep soul and body together, and will, in two or three weeks, generally starve the enemy out of his quarters. After this, a more nourishing diet may gradually be resumed. Many of the recent proprietary foods serve an admirable purpose in furnishing a large amount of nutriment in small bulk, which is easily digested. Among these may be mentioned proteinol, in teaspoonful to tablespoonful doses, liquid peptonoids, malted milk, koumiss, matzoon, etc. These latter are milk preparations with the cooling and refreshing taste of soda.

Indigestion. — Dyspepsia.

DYSPEPSIA is a disease of civilization. Savages know nothing of it. It is the costly price we pay for luxuries. All civilized nations suffer from it, more or less, but none so much as the people of the United States. It is here, in the new world, that the disease has become domesticated, and we, as a people, who have threatened to monopolize its miseries.

Few disorders inflict upon their victims greater suffering; yet it is not particularly dangerous, and it is even doubtful whether it tends very much to shorten life, unless the length of life be judged to consist in the sum of happiness enjoyed, — in which case few complaints shorten it more.

Symptoms. — These vary very much in different stages of the disease, and in different persons. In general the complaint begins with a sense of fullness, tightness, and weight in the stomach, sooner or later, after meals, and a changeable, diminished, or lost appetite. Occasionally, the appetite is craving, and when, in obedience to its promptings, a large meal is taken, there is pain in the stomach, with general distress and nervousness, and sometimes vomiting. Flatulency and acidity are common, with sour and offensive belching of wind; and very often there is a water-brash, or vomiting of a clear, glairy fluid when the stomach is empty. Dizziness is a prominent symptom. There is a great deal of what patients call an "all-gone" feeling at the pit of the stomach, — a weakness so great at that particular spot, that it is very hard to sit up straight. There is a bad taste in the mouth; the tongue is covered with a whitish fur; there is headache, heartburn, palpitation at times, high-colored urine, and tenderness, now and then, at the pit of the stomach. The bowels are generally irregular, sometimes very costive, at other times loose, when portions of food are passed off undigested.

Nervous Complication. — Such are the symptoms in a case of simple disorder of the stomach, when no other part of the system is materially involved. This is *indigestion*, well-marked, and distressing enough; but it is only a part of what is understood by a case of modern *dyspepsia*. In *this*, either the indigestion, in its course, disturbs and involves the nervous system, or the nerves become themselves disordered, and produce the indigestion. Sometimes one happens, sometimes the other, it matters not which; both are present — the affection of the stomach and of the nerves — in a case of thorough dyspepsia. To make out a full case, in its tormenting completeness, we must add to the above symptoms, great depression of spirits, amounting at times to complete hopelessness and despondency; a dread and fear of some impending evil; a lack of interest in passing events; unwillingness to see company or to move about; an irritable and fretful temper; a desire to talk of one's troubles, and nothing

else; a sallow, haggard, sunken, and sometimes wild expression of countenance; a dry, wrinkled, and harsh skin, with unrefreshing sleep, disturbed by all sorts of annoyances and difficulties, such as shipwrecks, falls down precipices, and nightmare.

The man who has all these symptoms, or any considerable portion of them, has *dyspepsia*, and is about as miserable as if all the sorrows of life were electrical currents, and were running through him continually.

Causes of Dyspepsia. — To healthy digestion, three conditions are especially necessary, — that the food should be well chewed and mixed with saliva before it is swallowed; that the stomach should pour out and mix with it the right amount of healthy gastric juice; and that it should be well *churned* while in the stomach.

It is well known that the first of these conditions, a thorough chewing of food, is rare in this country. We eat too fast; we do not masticate our food; we *bolt* it whole.

This is the first cause of dyspepsia, and it is the fruitful mother of causes. It furnishes the occasion for eating too much; for when the food is swallowed with such rapidity, the stomach is taken by surprise, as it were; it cannot secrete gastric juice fast enough to be diffused through the fast-growing mass; and the appetite does not decline until a great deal too much is taken. The coats of the stomach, being stretched unnaturally, do not pour out the gastric juice at the right time, or as much of it as is wanted, and what there is, is altered in quality.

Moreover, the stomach being overburdened, cannot turn over and churn its contents properly.

To fast eating, we may add, high-seasoned dishes, too stimulating for the stomach; eating between meals, and at unseasonable hours, — particularly at bed-time; excessive use of strong drinks and tobacco; habitually sitting up late at night; inactive habits of body; and excessive use of the mind.

No causes of dyspepsia are more active than those which disturb and fret the mind. It is surprising how suddenly any mental agitation will put an end to the appetite, and suspend digestion. And when these mental disturbances are protracted, when care becomes a daily and hourly companion, dyspepsia is almost sure to show itself. Considering the numerous causes of unpleasant mental excitement which we have in the politics, the business, the ambition, the family jars, etc., of this country, it is a wonder that dyspepsia is not even more prevalent. It is hard for the sensitive to escape.

These causes may seem too simple to be the frequent origin of so much misery, and yet whole volumes might be written on this one subject. One cannot too forcibly nor too frequently remind the reader of the importance of these simple and brief remarks. No treatment will avail if they are not heeded.

Urinary Deposits. — Before speaking of the treatment of dyspepsia, it will be proper to take notice of certain deposits in the urine, to which persons suffering from this complaint are liable, and the discovery of which will, in many cases, indicate the treatment.

Many dyspeptics have acid urine, which is loaded with *crystals of oxalate of lime*. These persons are much depressed in spirit, and look upon the dark side of everything. They are painfully disturbed by small annoyances, are irritable in temper, incapable of exerting themselves, look with dread upon the future, and generally have the dark and dingy look of the face which indicates functional derangement of the liver.

The most of these crystals are octahedral in form, and in the field of a good microscope are beautiful objects for inspection. (Figs. 100 and 101.) To obtain them, take a portion of urine passed in the morning (*urina sanguinis*), and let it stand till a deposit takes place. Pour off the upper portion of the urine; put a part of the remainder in a watch-glass, and gently heat it over a lamp. The heat will cause a deposit of the crystals.

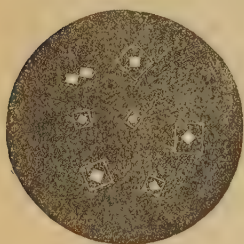


FIG. 100.

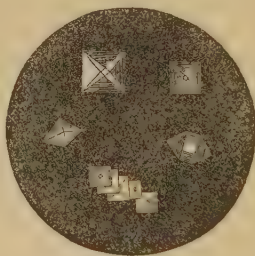


FIG. 101.

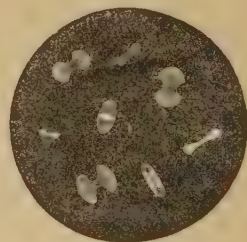


FIG. 102.

The oxalate of lime is frequently found in urine, the crystals having the form of dumbbells. When examined by polarized light, they appear beautifully colored and striated. (Fig. 102.)

The urate of ammonia, and uric acid gravel, are likewise found in large quantities in the urine of many dyspeptics. Some are exhausted by them, and reduced almost to skeletons, and to a wretched state of health, — having boils, eruptions, etc.

To find the urates, put a little of the urine containing the deposit in a test-tube, and warm it gently over a lamp. *If the deposit readily dissolve*, it is probably urate of ammonia (Figs. 103 and 104), and may then be examined under the microscope, to make the matter sure.

To find uric or lithic acid, let morning urine stand until a solid deposit has sunk to the bottom; then pour off the liquid, and place some of the solid portion upon a glass, and examine it with a microscope, and if this acid be present, its peculiar crystalline forms (Fig. 105) will be discovered, either alone, or mixed with urate of ammonia.

In those cases in which there is a great prostration of the *nervous* system, with a loss of sexual power, bad feelings in the head, perhaps pain and weakness across the loins, and a tendency to consumption,



FIG. 103.



FIG. 104.

we may suspect the presence of the triple phosphates in the urine. Phosphorus is one of the elements of the brain and nerves, and when there is a constant drain of this element through the kidneys, the nervous system is gradually exhausted. To find the triple phosphates, put some morning urine in a glass vessel, and let it stand till a sediment has gone to the bottom. Put some of the sediment in a test-tube, and warm it gently over a lamp. If the warmth do *not* dissolve the deposit, add to it a little acetic acid; *if the deposit dissolve in the acetic acid, it probably consists of earthy phosphates.* This is then to be examined under the microscope to ascertain whether it is the phosphate of lime, the triple phosphate, or a mixture of both.



FIG. 105.

Fig. 106 shows us the prismatic crystals of the triple phosphate. In a few rare cases, these are penniform (Fig. 107). Fig. 108 gives us another specimen of the crystals of the triple phosphates, as they

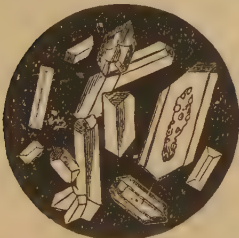


FIG. 106.



FIG. 107.



FIG. 108.

appear under the microscope, mixed with amorphous particles of phosphate of lime. If an excess of ammonia be added to the urine, the crystals become star-like and foliaceous, as in Fig. 109.

Treatment of Dyspepsia. — As there are few complaints which distress the patient more than dyspepsia, so there are few which give the physician more trouble. Generally our art has failed upon it because too much has been required of us. We have not merely been asked to cure the disease, but to do it while the patient continues the indulgence of his appetite, or his excessive application to business or study. It has been expected of us, that with medicine we should contravene the laws of nature, and restore health while the causes of the disease are in full activity.



FIG. 109.

This complaint is often brought on by not keeping the bowels open. To cure it, therefore, one of the first things to be done is to remove costiveness and regulate the bowels.

One of the very best articles I know of to remove constipation is Parraut's Aperient. I have placed it in the department of Pharmacy; it ought to be in the United States Dispensatory. Taken immediately after meals, in doses of a teaspoonful, it corrects acidity of the stomach, it gently opens the bowels, and when its action is over, will be found to have diminished the costiveness, rather than increased it, as most kinds of physic do. It is excellent in the bilious forms of dyspepsia, — acting finely upon the liver, — particularly if a few drops of aqua regia in water be taken before meals, — the aperient being taken after.

If *piles* exist, this mixture will be objectionable on account of the aloes, and the fluid neutralizing extract may take its place. Sweet tincture of rhubarb and soda (37), is sometimes preferable to the aperient.

Several other preparations (38), (39), will be found useful to remove costiveness and debility of the stomach.

For acidity, besides the remedies already mentioned, prepared charcoal may be used, in teaspoonful doses, or carbonate of magnesia, or fluid magnesia, or trisnitrate of bismuth. A good remedy is pulverized guaiacum, rhubarb, prepared charcoal, and carbonate of magnesia, equal parts; also (28), (37), (38), (42). If crystals of oxalate of lime be found in the urine, give a few drops of aqua regia, in water, three times a day.

Hygienic Treatment. — The diet must be managed with great prudence. Food must be taken in such quantities only as the stomach can digest, however small that quantity may be; and it must be taken slowly, and well chewed. No article should be touched, or thought of, which disagrees with the stomach. Costiveness may frequently be entirely removed by eating no bread except that made from unbolted wheat-flour, commonly called Graham bread (that made from Franklin Mills flour), or by making one of the three daily meals of

boiled cracked wheat, with milk or molasses. If the triple phosphates be found in the urine, there is a special reason why the unbolted flour, or the cracked wheat should be used. The wheat-grain abounds in phosphorus, the largest portion of which is in the bran, and this is much needed when the kidneys are robbing the brain of its phosphoric element.

Not too much Brain-work.—It is important that the brain and nervous system should be relieved of the burden of too much work, and that the thoughts should be turned into the most agreeable channels. If the patient would get well, the disinclination to move about and see company *must* be resisted. In many cases, dyspeptics are like sea-sick persons,—feeling as though they would rather go overboard than move. In such instances, friends must not be harsh with them, and frown upon their listlessness as if it were a fault; but rather treat them affectionately, and beguile them out by all sorts of pleasing enticements. Exercise *must* be had, every day, and be connected, if possible, with an object, so that it may be performed cheerfully. It is important *to engage the mind in the exercise*; and for this purpose, some contested game is very useful, as playing at billiards, rolling nine-pins, pitching quoits, or, where the strength will permit, playing ball or riding the bicycle.

Cheerfulness.—Nothing does more to drive away dyspepsia than a cheerful, lively, and even *mirthful* state of mind. All the nervous influences sent from the brain to the stomach should be of the most agreeable kind. Some people think it vulgar to laugh. Let such stand with long faces in life's shadows, if they choose. As a general rule, the best men and women laugh the most. Good, round, hearty, side-shaking laughter, is health for *everybody*; for the dyspeptic, *it is life*.

Dyspeptics who have a taste for it, and can endure the expense, should travel. A voyage to Europe, and a year spent in seeing the wonders of the old world, will generally cure the most stubborn case of indigestion. This, however, depends upon circumstances. For those having the finer organizations and the higher natures, extensive travelling is sometimes indispensable. The narrow circle of thoughts, associations and things in their own neighborhood, do not fill the compass of their wants; their many-sided faculties need to be drawn on by the large variety to be found only in travel. Their large and impressive natures want to be filled full in order to drive out disease, and it takes a world, or a considerable part of it, to fill them. The dyspepsia of such natures is not comprehended by the multitude, and even physicians are often amazed that their narrow prescriptions do not reach it.

Heartburn. — *Cardialgia*.

THIS is a gnawing and burning pain in the stomach, attended by disturbed appetite. It is generally caused by great acidity of the

stomach, and is a symptom of dyspepsia, and often afflicts pregnant women. Whenever too much food is taken, it is liable to ferment, and become extremely sour, — causing heartburn. In such cases, vomiting often occurs; and what is thrown up is sour, and sometimes bitter.

Treatment. — Immediate temporary relief may be obtained by swallowing a teaspoonful of soda, magnesia, or chalk, in a tumbler of cold or warm water. Fluid magnesia, or lime-water, will answer the same purpose. If there is wind in the stomach, as well as acidity, a teaspoonful of the aromatic spirit of ammonia, or (135), will often still the uneasiness in a moment.

To cure the complaint, the stomach must be strengthened by the remedies directed for dyspepsia.

Spasm or Cramp in the Stomach. — *Gastrodynia.*

THOUGH generally of shorter duration, this is more violent than heartburn. It is attended by a sense of fullness, by anxiety, and by great restlessness. In females, hysterical symptoms are often coupled with it. Great quantities of air or gas are generally expelled, and the pain shoots through to the back and shoulders.

Treatment. — A strong purgative injection (248) will often bring immediate relief. The sweet tincture of rhubarb and soda (37), with a few drops of tincture of cayenne mixed with it, will often bring speedy relief. So will a mustard poultice laid upon the stomach. The mustard poultice is a remedy of great excellence, in many cases. It deserves to be called the poor man's friend.

Water-Brash. — *Pyrosis.*

THIS consists in a discharge from the stomach, generally in the morning, of a thin, glairy, watery fluid, sometimes insipid, at other times sweetish, and at still others sour. A burning heat or pain in the stomach attends, and seems to be the immediate cause of the discharge. The discharge appears to be the natural mucus of the stomach, which is poured out in large quantities in consequence of a kind of catarrh of its mucous lining. The amount thrown up varies from a spoonful to a pint or more.

The complaint is caused by a poor, innutritious diet, or by whatever causes the blood to become thin and watery.

Treatment. — Ten or fifteen drops of water of ammonia, in half a tumbler of water, will quiet the distress, and check the discharge. The most effectual remedy I am acquainted with for breaking up the discharge, is the trisnitrate of bismuth, taken at meal-times, in from twenty to thirty-grain doses, three times a day. The compound powder of kino is a valuable remedy. The compound tincture of senna and the tincture of balsam of tolu, in equal parts, and administered

in tablespoonful doses, are sometimes useful. The tincture of *nux vomica* is a good remedy.

To restore the blood, some of the various preparations of iron (74), (80), (73), (316), will be required.

The diet should consist of easily-digested, nutritious food, — as soups, broths, fresh meat, and unbolted wheat-bread.

Vomiting.

THIS occurs under a great variety of circumstances. It may be induced by acidity of the stomach, by irritability of the stomach, by distress of mind, by injury of the brain, by offensive odors, and by all organic diseases of the stomach.

Treatment. — Generally, it is cured by treating the disease which induces it. But in many cases it persists very obstinately, and may become the chief thing to be attended to. In such cases, it may require a careful investigation of the cause to check it. But generally some aromatic, as ginger, spearmint, peppermint, or spice-tea, will put an end to it. Some cordial or stimulant, as brandy, champagne, tincture of ginger, paregoric, elixir solutis, or cherry brandy, will answer well. Strong coffee, without sugar or milk, will, in some cases, act like a charm. If it is dependent on acidity, the remedies are given under “*dyspepsia*.” If caused by irritability of stomach, a pill of extract of belladonna and ipecac (339) will do well.

While vomiting, the patient should lie still in bed, and in bad cases, a mustard poultice should be placed upon the stomach.

The vomiting of children may sometimes be stopped by wetting a piece of cloth with laudanum, and laying it upon the pit of the stomach.

Seasickness.

THIS is the great terror of persons who, for the first time, cross the ocean. It is said that dark-complexioned persons suffer more from it than others.

If it cannot be entirely prevented, it may be mitigated by lying flat upon the back. To lie on deck, in the open air, is much better than lying in the close air of the cabin or stateroom. A wineglass of brandy, or iced champagne, sipped now and then, will relieve the sickness very much. For a child, it is sometimes sufficient to wet a cloth with mustard, and lay it upon the pit of the stomach. Creosote, one drop at a dose, made into a pill, is excellent. Ten drops of hartshorn, in half a tumbler of water, is good for some. Bromide of soda in large doses, daily, prevents it, or bromo-cafein when it first comes on. Cocaine in one-eighth grain doses every twenty minutes is usually very helpful. A spinal ice-bag placed

opposite the stomach while the sufferer lies upon the back will do more toward curing sea-sickness than any other single remedy. These bags are about eight inches long, made of thin rubber, and are to be filled with small pieces of cracked ice. When the ice melts refill the bag.

Milk Sickness.

THIS disease prevails in the West, chiefly in the neighborhood of level, heavily-timbered, rather wet oak-land.

The cattle, horses, and sheep, which range in this land, are frequently attacked by a disease which the people call the *trembles*. It is supposed to be produced by eating some plant growing upon those lands, as cattle which feed in the neighboring regions are free from it until they find their way into these low grounds. It has been suggested that the offending plant may be the *poison ivy* (*rhus toxicodendron*). Be this as it may, the calves, soon after sucking cows which have run in these grounds, are seized with trembling, and frequently die of the disease. Dogs which lap the milk are affected in a similar manner. Children drinking it leave the table and vomit. Upon grown persons the effects are more severe, but not so sudden. The eating of the beef, mutton, or veal, of affected animals, brings on the same disease.

Symptoms.—The disease sets in with sickness at the stomach, which is preceded by general debility, more particularly of the legs. There is nausea, vomiting, and the breath is so offensive and peculiar that those acquainted with the complaint immediately recognize it from this smell.

These existing for weeks, constitute, in some cases, the whole of the symptoms. In other cases they are more severe, being attended by chills and flushes, great oppression about the heart, anxiety, deep breathing, heat in the stomach compared to fire and boiling water, violent retching and vomiting, alarming beatings of the heart, and throbbings of the large vessels, and cold extremities,—producing, all together, extreme distress.

In most cases, the vomiting returns every hour or two, attended by great burning at the pit of the stomach, the substance thrown up having a peculiar bluish-green color, and a sour smell. As soon as this discharge takes place, the patient falls back upon the pillow, and lies easy until another turn comes round. The tongue is covered with a whitish coat, the bowels are obstinately costive, and the pulse is small and quick.

Treatment.—It is believed that the neutralizing mixture, given in tablespoonful doses every time the nausea and burning sensation are felt, is the most effectual remedy yet used. It relieves the acidity, and seems well adapted to allay the irritation. Some antibilious physic (40) to move the bowels should also be given.

Besides these remedies, a mustard poultice should be put upon the stomach, and hot bricks to the feet, and the patient be kept still for some hours. The diet should be very mild, — only toast-water, rice-water, or thin gruel.

Acute Inflammation of the Peritoneum.—Peritonitis.

THIS disease affects the extensive membrane which lines the whole inside of the belly, an extension of which forms the omentum or apron. It is an inflammation to which women are much exposed after confinement, and is known, in such cases, as child-bed or puerperal fever. It is common among men also, and is a grave disease.

The accepted notions of no disease have undergone so much of a revolution of late years as those relating to peritonitis. It was formerly considered to be generally of spontaneous or idiopathic origin, whereas now we know it to be the outcome of some one of several diseases, but lately understood, as for instance, appendicitis, septicaemia or blood-poisoning, inflammation of the fallopian tubes and ovaries, tuberculosis, abscess of gall-bladder, strangulated hernia, etc.

Symptoms. — Like other forms of fever and inflammation, it is preceded by chills, with increased heat of surface, thirst, full, strong, and frequent pulse, flushed face, and red eyes, dry tongue with red edges, dry skin, restlessness, short, quick breathing, nausea and vomiting.

The pain is increased by the patient sitting or standing up, — the bowels being thus pressed against the inflamed membrane. Lying upon either side is painful for the same reason. To lie flat upon the back, with the feet drawn up, is the only endurable position. The patient lies *still*, for all movements give pain.

The pain in this disease is generally sharp, cutting, and pricking, but is not always equally intense. It is aggravated by the passage of wind along the bowel, by which the inflamed membrane is slightly stretched.

When the disease is advancing towards a fatal termination, the belly becomes greatly swollen and tense, — having to the hand a peculiarly tight, drum-head feeling; the pulse is rapid and feeble; the countenance is full of anxiety, and is pinched and ghastly; and a cold sweat breaks out.

Treatment.—No time should be lost in calling a competent surgeon to see a case with symptoms of peritonitis, for as before pointed out there are comparatively few cases but what depend upon some disease which will require operating upon the abdomen. It is of the utmost importance to distinguish local inflammation within the belly wall so that no time will be lost when it is so important that an early operation should be performed if needed.

The two main indications in the treatment of peritonitis after having discovered and treated the causes, are the thorough draining of the bowels of their watery secretions by some gentle saline which will not stir them up; and secondly to maintain them in a state of quiet and rest. The first is met by magnesia in the form of the solution of the citrate, say one-half bottle every four hours till copious watery movements occur. This drains the glands and causes a flow of the poisonous effete material into the bowels and rids the system of so much poison. The second indication is met by opium in some of its many forms. It is often, however, a serious problem for even the physician to decide, and should only be undertaken with his advice.

The drinks should be lemonade, soda-water, tamarind-water, currant-jelly dissolved in water, and preparations (298) and (299). Indian-meal gruel, toast-water, barley-gruel, and the like, are the only allowable diet.

Chronic Inflammation of the Peritoneum.

WHEN the acute inflammation of the peritoneal membrane is not successfully treated, it may run on for a time, and then subside into a lower grade of inflammation, called *chronic*, and in this state remain for an indefinite time. But it often arises independently of the acute disease, and attacks persons of both sexes, and of all classes and ages. Scrofulous children have it, and, wasting away under it to mere skeletons, are said to have *consumption of the bowels*.

Symptoms. — These are sometimes very obscure, and the advances of the disease stealthy. At first there may be only a little soreness of the belly, so slight as not to be noticed except after hard work, or upon some wrenching motion. Generally, there is a sense of fullness and tension of the belly, although it may not be increased in size. After a time, it enlarges a little, and its tension or tightness increases, especially towards evening. By pressing carefully with the hand, a deep-feeling tension may be detected, giving to the hand a sensation as of a tight bandage underneath, with the skin and integuments sliding loosely over it. If water has been poured out into the abdominal cavity, its fluctuation may be frequently detected by pressing upon one side of the belly with the palm of one hand, and striking the other side with the ends of the fingers.

As the disease goes on, the features become sharp and contracted, and the countenance grows pale and sallow. Costiveness comes on, sometimes chills and fever, with debility, loss of flesh, cough, difficult breathing, hectic, and swelling of the legs.

Treatment. — Costiveness, if present, may be relieved by Mettauer's aperient, or the neutralizing mixture, assisted by coarse bread, and boiled cracked wheat.

Daily bathing is especially necessary, particularly the alkaline sponge bath, with vigorous friction over the bowels. The warm bath once or twice a week will be useful. In some cases, a wet towel laid upon the bowels over night, and well covered by flannels, will afford relief; or the compound tar-plaster may occasionally be used.

If there be dropsy of the belly, iodide of potassium (138) should be taken freely, and the skin made sore over the inflamed part, by tincture of iodine, well rubbed in, once a day.

If the patient be pale and bloodless, give iron, quinine, etc. (74) (75), and let the diet be nourishing; and if nervous symptoms be connected with the debility and paleness, add some nerve-tonic (93), (81), (316). When the disease is known to be the outcome of a deposit of tubercles on the peritoneum, it is now customary to open the abdomen under antiseptic methods and wash out the cavity. The effect of a mild salt-solution and the light and air oftentimes arrests the disease.

Acute Inflammation of the Bowels. — *Enteritis*.

By inflammation of the bowels is generally understood an inflamed condition of the *mucous membrane which lines them*; but this, most commonly, is only a part of the disease; it involves more or less, besides this mucous lining, the whole substance of the bowel. After an inflammation has existed some time, and even, in severe cases, at the start, certain poisonous substances are formed as the result of germ invasion, called *toxines*. These are genuine poisons, and often spread rapidly through the walls of the bowels by means of the numerous lymphatic vessels to the peritoneum itself, — that delicate membrane which we have seen covers all organs within the abdominal cavity. When this membrane once becomes poisoned, an acute inflammation sets up, which masks all other symptoms, and is indeed a veritable blood-poison. We have then to deal with peritonitis.

Symptoms. — The disease begins with a chill, and with uneasiness and slight griping pains, which increase in severity until they are intense and burning. Pressure aggravates the pain, which is most intense about the navel, but extends more or less over the whole bowels.

From the beginning there is sickness at the stomach, and sometimes vomiting; there is loss of strength, costiveness, great anxiety, thirst, heat and fever, dry, furred, and red tongue, and but little urine, with pain in passing it. The matters passed from the bowels are dark and fetid; and the whole belly is tender and sore to the touch. The pulse is quick, hard, and small.

The stomach will be but little affected, comparatively, when the disease is at some distance from it in the lower portion of the bowels. Indeed, the nearness of the inflammation to the stomach, or its remoteness from it, may be judged pretty correctly by the degree of

disturbance in that organ. The length of time after drink and medicines are swallowed, before they are vomited up, is a pretty good measure, likewise of the distance of the disease from the stomach.

How to Discriminate. — This disease is liable to be confounded with colic, and with inflammation of the peritoneum. It is important to distinguish it from colic, particularly, because the treatment for that would aggravate this. In this disease the pain is increased by pressure; in colic, it is not, but is rather relieved. In enteritis, the pain remits, but never ceases wholly, as it does in colic. In enteritis, the knees are drawn up, and the breathing is short; in colic it sometimes gives relief to stretch the feet down, and the breathing is not altered.

To distinguish it from inflammation of the peritoneum, take notice that diarrhoea is much more common than in this latter complaint, while the pulse is not as quick, nor the pain as severe.

Treatment. — This should be very much the same as that recommended for peritonitis.

The tincture of veratrum viride, in full doses, so as to keep up a free perspiration, cold compresses, mustard poultices, hot fomentations, poultices, blisters, soothing and quieting injections, and demulcent drinks, as slippery elm, marshmallow, flax-seed, etc., if judiciously applied, will do about all that we have it in our power to accomplish.

In this disease it is well to inquire if the patient has a hernia, for if so, it is liable to become strangulated without his knowledge. A strangulation of the gut may be the *cause* of the disease. When this happens, the complaint is very unmanageable. Here again magnesia may be of signal benefit unless the movements are already too copious and exhausting, in which case disinfectants or astringents must be resorted to. The possibility of tuberculosis must not be ignored.

Chronic Inflammation of the Bowels.

LIKE other chronic inflammations, this may follow the acute form, but it also results from various other causes, as unripe fruit, taking cold, drastic physic, and improper treatment of other diseases

Symptoms. — Red end and borders of the tongue, dull pain in belly, increased by pressure and rough motion, abdomen either swelled or flat, skin dry and husky, feet and hands cold, small frequent pulse, thirst, loss of flesh, low spirits, urine scanty and high-colored, and dirty, slimy discharges from the bowels, from one to four times a day.

Treatment. —If the bowels are hot, bind a cold compress upon the belly over night, covering it well with flannel. The warm bath should be used twice a week. Salol, ten grains every three hours, bismuth and opium, are in this case very valuable. Washing out the lower bowel with hot water by means of a syringe often soothes and heals.

The diet must be of the most simple, unirritating kind, beginning with a solution of gum-arabic, rice-water, barley-water, arrow-root or sago-gruel, and gradually rising, as the symptoms improve, to beef-tea, mutton and chicken broth, tender beefsteak, etc.

When the strength will permit, gentle exercise must be taken in the open air, but not on horseback, or in hard, jolting carriages.

As soon as the inflammation is subdued, some mild laxative (35) may be given, in connection with an infusion of wild-cherry bark, geranium, and Solomon's seal, equal parts.

Appendicitis.

THIS is one of the so-called modern diseases, — not that it has not existed for a long time, but that not till lately has it been recognized as a distinct ailment. Formerly it fell under the general category of peritonitis or inflammation of the bowels. American physicians have done more toward discovering its characteristics than others. It is an inflammation of the appendix vermiformis, which is situated at the end of the large bowel, in the right flank, close to the junction of the colon with the small bowel (see manakin). This organ is a small, round, tail-like body, about the size of a slate-pencil, and averages some three inches in length. It is hollow, lined with mucous membrane, and covered like the bowel proper with a peritoneal membrane. It secretes mucus. Its use is as yet unknown, being thought by many to be a rudimentary organ like the uvula, without function, and possibly analogous to the herbivorous stomach. Whenever small seeds enter the cavity of this organ (which is in reality a rare occurrence) or whenever, from any cause, a catarrhal inflammation is developed in it, the secretion increases, and being confined, aggravates the trouble. This catarrhal inflammation is generally mild and the trouble often subsides either for good or to start up again sooner or later.

The inflammation may, however, become *purulent*, the germs penetrating the walls of the appendix and causing a general inflammation of the peritoneal coat of the bowel. In these cases nature fights hard to resist the invasion of the germ and throws out a large amount of lymph and serum, which, when it hardens, often acts as a barrier to the further progress of the peritonitis which has begun about the appendix. These cases are characterized by a hard lump in the appendicular region, the inside of which contains pus as a rule, which

has escaped from the bursting appendix. Cases of this class are extremely dangerous and require the immediate aid of a surgeon, as they are bound to give trouble sooner or later, even if the first attack does not prove fatal.

There is still a third class of cases, called fulminating, because from the very first they seem to be purulent, and spread rapidly into a general peritonitis, death occurring within a few days from the appearance of the first symptoms. These cases are the most hopeless of all, and must be operated on without the slightest delay, since immediate evacuation of the pus, before a general infection of the abdominal cavity supervenes, is the only possible hope of saving the patient.

Symptoms. — The disease, as generally observed, begins with languor and pain in the abdomen, with special soreness on the right side, oftentimes nausea and vomiting, constipation, a slight rise of temperature, and headache. As the disease progresses the tenderness amounts to pain, a bunch may be felt by the medical attendant: the temperature gets a little higher and symptoms of pus formation set in. The case may hang in this initial stage (up to the point of pus formation) for several days and finally subside, it being a more or less catarrhal inflammation; but when pus has once formed the patient cannot escape without an operation for the removal of the offending body. Many surgeons at the present day even take the ground that every inflamed appendix should be removed.

Treatment. — The medical treatment consists in giving magnesia in form of the solution of the citrate, with a light diet, and keeping the patient in bed. Poultices may be of some benefit. Opium should not be used unless pain is extreme.

The operation for appendicitis, when performed between the attacks, is a comparatively safe one in competent hands; but it becomes a very grave one if pus forms rapidly and invades the general abdominal cavity. Between these two classes of cases there are all grades of difficulty and danger.

Cancer of Intestine.

THIS disease is much less frequent than cancer of the stomach, constituting about five per cent of all cases of cancer. It occurs usually about the middle period of life. We are in absolute ignorance of its causation in this region. The rectum is the most favorable part of the bowel for its development, the large intestine next, and then the small intestine.

Symptoms. — Intestinal hemorrhage, pain; emaciation, irregular movements of the bowels, pain in the sacral region, radiating to the genitals and down the course of the sciatic nerves (in case of rectal cancer), are among some of the indefinite symptoms of cancer of the

bowels. When well marked and when located favorably, a tumor may be discovered by palpation, but often this cannot be felt and the masses which at first seem to indicate cancer may afterward prove to be merely faecal accumulations. When the mass can be felt in the rectum the diagnosis becomes clearer. The prognosis of the disease is extremely unfavorable.

Treatment. — As for treatment, only in rare cases is much aid ever procured. The formation of an artificial anus in the left flank may avert for a while the final end. The injection of the new cancer-serum is still of doubtful success.

Opiates to relieve pain, nourishing food frequently repeated, and the use of antiseptic enemas, are, for the most part, the chief measures that afford relief.

Intestinal Obstruction.

THIS is a mechanical interference with the movements of the faeces, and is caused either by intussusception or invagination, constriction, twists, stricture or hernia. These conditions are frequently produced by irregular movements of the bowels as a whole, and by irregular movements in various parts of the same, there being an increased peristalsis in one part and constipation in an adjacent part. Many cases of intussusception occur at the ileo-caecal valve, the small bowel entering the large bowel and being driven downward. The circulation of the bowels is naturally interfered with, and intense congestion occurs, with swelling and final obstruction of the calibre of the gut. Pain becomes paroxysmal and peritonitis ensues. Pain increases, with vomiting and the discharge of mucoid stools; finally the patient dies of exhaustion.

Constriction of the bowel forms the larger proportion of cases and is not infrequently caused by fibrous bands which are the result of inflammation. Strangulation may be produced by a loop being held down by such bands or by being twisted about it. Intestinal obstruction, ulceration, and even perforation are common results.

A *twist* or *volvulus* is also a cause of obstruction, though less common than the two causes just mentioned, and occurs generally near the sigmoid flexure.

Stricture of the bowel usually occurs at the sigmoid flexure, or in the rectum, and is not usually complete, some small amount of faecal matter still escaping. Tumors, like cancer, not infrequently cause stricture by their compression.

Functional obstruction occurs chiefly in hysterical females, but also in disease of the brain and spinal cord, as well as from peritonitis and blows on the abdomen. It is the result of a paralysis of the bowel.

Impaction of faeces is still another frequent cause of obstruction. The contents of the bowels, especially in the rectum, become hard,

blocking the passage till quite a perceptible bunch may be felt externally. The channel is not always blocked completely. Gall-stones may become impacted near the ileo-cæcal valve in their passage downward, and form the starting point of the fæcal accumulation.

These various causes produce either acute or chronic obstruction.

Symptoms. — In the acute variety, pain, vomiting and constipation are the prominent symptoms. There are at first some digestional disturbances, with moderate pain. Afterwards the pain becomes severe, even intense, and is usually located near the seat of the obstruction. It is at first colicky and intermittent, but finally becomes continuous and severe over the whole abdomen. Vomiting sets in, first of food, then later of bile, and finally stercoraceous if the obstruction becomes complete. Vomiting occurs whether the obstruction is in the large or small bowel. Before the close of the scene this vomiting assumes a ricewater-like character, perhaps attended with hiccough.

There is an absence of the passage of wind, although at first some small amount of fæcal matter may pass. In intussusception there are usually bloody discharges in addition to constipation. The abdomen of course soon becomes tympanitic or swollen, and sounds of water and gas may be heard very distinctly.

The general symptoms are those of a very grave disease, — restlessness, cold extremities, pinched features, and cold, clammy skin. The pulse is small, the temperature generally subnormal, tongue dry, and thirst very pronounced.

In the event of *chronic obstruction*, all these symptoms appear very much more gradually. Pain is less severe, vomiting often absent till the obstruction becomes complete. The fæcal matter may often be several feet long before the obstruction becomes severe. Long-standing constipation which does not respond to proper laxatives should arouse suspicion. The stools themselves are often ribbon-like in shape and very small, not infrequently resembling the fæces of sheep.

The prognosis of obstruction of the bowels is usually very grave, and the duration of life varies from a few hours to ten or twelve days. The higher up the obstruction, the worse the prognosis. Simple fæcal impaction perhaps offers the most hope; next those cases amenable to surgical interference.

Treatment. — Opium to relieve pain and to stop the exaggerated peristaltic movement in parts of the bowel above the obstruction is surely indicated; it also relieves the vomiting. Continued, large enemata of suds and oil, and even the addition of turpentine, should be resorted to at once as soon as the trouble has been made out. These are best given with the hips elevated, and should consist of four to six quarts of water; they are to be given slowly and without much force. Oftentimes an anæsthetic is needed.

If the obstruction is from fæcal impaction, small, repeated doses

of some saline should be used ; say two ounces of the solution of the citrate of magnesia every two hours. Castor-oil in teaspoonful doses hourly till movement occurs is also good. But if the obstruction is from intussusception, twist, stricture, etc., all laxatives must be strictly interdicted. Finally, these simple means failing and the case be suspected to be due to impaction by foreign bodies, fibrous bands, etc., the abdomen must be opened and the seat of the obstruction found and if possible removed. The operation in this class of cases is not attended with a great percentage of recoveries, and yet the fatal termination is much surer if left alone ; in many cases it is brilliantly successful.

External methods of treatment by hot fomentations of turpentine, and even of massage, often add greatly to a favorable termination.

The diet must be very light and nutritious, and in case of vomiting must be given by the rectum. After the obstruction has been relieved, one must be very careful about the diet and see that the bowels are open daily.

Wind Colic. — Flatulent Colic. — *Interalgia*.

THIS is a severe and distressing pain in the bowels,—sometimes a stoppage, and a swelling about the pit of the stomach and the navel. What children call *belly-ache* is a mild form of it. The wind passing from one portion of the bowel to another causes a rumbling noise. The pain is not increased by pressure ; and this distinguishes it from the pain of inflammation. It moves about, too, from place to place, and is much relieved by the escape of wind up or down.

The complaint may be caused by a weakness in the digestive organs, by eating indigestible food or unripe fruit, by costiveness, and by taking cold. Some persons always have the colic excited by eating certain kinds of fruit.

Treatment.—When the complaint is caused by an indigestible substance taken into the stomach, the offending matter should be thrown off by an emetic as soon as possible. If this does not bring relief, let it be followed by a dose of salts, salts and senna, compound infusion of senna, elixir salutis, elixir pro., or sweet tincture of rhubarb. If there is no sickness of the stomach, a little essence of peppermint or spearmint in hot water, or brandy, gin, or whisky, in hot water, may prove sufficient to expel the wind, and relieve the pain. Ginger and hot water does well with some. If there be costiveness, and the pain is obstinate, let the bowels be unloaded by a stimulating injection (248), (249), (250). Inject one dram of ether in a little starch-water into the bowels, and relief will often be instant. It can be repeated every half-hour. The injection of a table-spoonful of turpentine in suds can also be tried and repeated every two hours.

Air-Swellings. — *Tympanites.*

It is quite common for persons in delicate health — particularly females — to have their stomach and bowels swell up, sometimes slowly, sometimes suddenly, so that they cannot bring their clothes together. They do not know what to make of it; it sometimes alarms them; and they ask their medical adviser what it means.

These swellings may occur from an accumulation of air within the bowels, and also within the abdominal cavity. This latter gives the belly a peculiarly hard feel, like the head of a drum, and when it is pressed upon with the finger no indentation remains. It usually is the result of a weakened sympathetic nervous system, brought about by some one of the many abdominal diseases.

Treatment. — If the air be in the intestinal tube, a stimulating injection may bring away the wind. It may be composed of one pint of infusion of peppermint, one gill of tincture of prickly-ash berries, half a gill of tincture of castor, and a teaspoonful of ginger. The bowels of the patient should be rubbed for a long time; and in all forms of the complaint, it would be well to do this every day. Sometimes the wind may be drawn off by inserting into the rectum a long rubber tube. Treatment often resolves itself into a cure of some existing uterine or ovarian disease and the various phases of peritonitis, in which latter case there is fever and other well marked symptoms.

The best constitutional remedies are tonics, — iron, quinine, mineral acids, and bitters, (48), (55), (59), (60), (62), (63), (64), (71), (73).

Exercise in the open air, and a careful regulation of the diet, will do much towards removing these troubles. Costiveness must be carefully guarded against.

Bilious Colic.

THIS is a dangerous disease. There is pain of a griping, twisting, tearing kind, — what the ancients called *atrocious pain*. It is chiefly about the navel, but sometimes tortures the whole belly. It comes and goes in paroxysms. Sometimes the abdomen is drawn in, at other times it is swelled out, and stretched like a drum-head. At first the pain is relieved by pressure; after a time the belly is tender to the touch. There is thirst and heat, and a discharge of bilious matter from the stomach. In the worst cases, the pulse is small, the face pale, the features shrunk, and the whole body covered with cold sweat. While the head is hot the feet are cold. In advanced stages of the disease, the action of the bowels is sometimes reversed, and the fecal matter forced up through the mouth, owing to impaction of faeces or other obstructions of the bowel.

Causes. — Costiveness, irritating substances in the bowels, thick, vitiated bile, long exposure to cold, torpidity of the liver and skin, great unnatural heat, with dampness, obstructed gall-duct, etc.

These attacks are usually the result of indigestion in the upper bowel, near the bile-ducts, creating a thick mucus which obstructs the passage of bile from the ducts into the bowels. A regulation of the duct, small doses of podophyllin or the acids, with daily doses of some mild bilious laxative, will prevent their return. Crab-orchard water, sal-muscetelle, and other simple medicines answer every purpose.

Treatment. — Administer an active purgative injection immediately (251), (252). Internally, dioscorin, camphor, etc. (340), every fifteen minutes until relief is obtained, at the same time covering the whole belly with a large mustard-poultice. A strong decoction of the wild-yam root, drunk freely, is a medicine of some value, — so is a decoction of sculleap and high-cranberry bark, equal parts. This latter article is excellent in spasmodic affections, on which account it has gained the name of *cramp-bark*. The sickness at the stomach may frequently be allayed by effervescing drafts, to which twenty-five or thirty drops of lavender are added. Croton-oil, given in one-drop doses, done up with crumb of bread, will sometimes succeed well as a purgative medicine; or castor-oil and spirits of turpentine, equal parts, in two great spoonful doses, may be tried before the croton oil.

The warm bath is worth remembering, and trying, too, if the means are at hand. Hot fomentations of the bowels with a decoction of poppy-leaves, stramonium-leaves, hops, wormwood, boneset, or peppermint leaves, should not be overlooked. Bottles filled with hot water, or hot bricks rolled in flannel, should be placed at the back and feet to promote perspiration.

Persons subject to this complaint may derive advantage from one pill composed of extract of high-cranberry bark, etc. (100), taken after each meal for some months. At the same time a reasonable amount of exercise should be taken out of doors, and a sponge bath, with friction, be employed daily. Care should be taken not to be often exposed to the hot sun.

Painters' Colic. — *Colica Pictorum*.

THIS form of colic is caused by the slow introduction of lead into the system, — generally the carbonate of lead. It passes under the different English names of painters' colic, Devonshire colic, and dry belly-ache. The first of these is the name by which it is most commonly known, from its frequent occurrence among painters, who use white lead (carbonate of lead) a great deal in the preparation of their colors.

Symptoms. — The disease generally comes on in a very gradual

way. At first, the appetite is impaired, there is a slight nausea, belching of wind, languor, very obstinate costiveness, transient pains, with a feeling of weight and tightness in the belly, and a disinclination to make any exertion.

By degrees, the pain in the bowels, and particularly about the navel, becomes more severe, and has a *twisting* character. The belly becomes hard, drawn in, and a little tender to pressure, and the stomach very irritable. The pain occasionally slacks off a little; but never, even in mild cases, entirely stops, as in other kinds of colic.

In some severe cases, the pain runs up to the chest, and down the arms; also down to the bladder, causing the urine to be passed with pain and difficulty, and giving a sense of weight and bearing down in the lower belly. During the severest pains, the countenance is pale, contracted, and full of suffering; cold sweats break out upon the face and limbs, and anxiety and agitation seize the patient.

When the disease is not seasonably removed, it degenerates into the chronic form, the mental and physical energies become torpid, the circulation in the small vessels inactive, the skin dry, harsh, shrivelled, pale, sallow, or of a leaden hue, the temper irritable, desponding and gloomy, and the body wasted. Besides all this, the muscles which lift up the lower arm become *palsied*, so that, when the arms are raised, the hands hang down in a helpless condition. In some cases, there is a blue line along the edges of the gums.

Treatment. — For relieving the pain and opening the bowels, the treatment should be very much the same as that for bilious colic. There is one article, however, which is thought to have some special influence in curing this disease, after it has become chronic; it is alum. Fifteen grains of alum, two of aloes, two of jalap, and four of ipecac powder, may be mixed, and taken for a dose two or three times a day. If the muscles of the arm be palsied, one thirtieth of a grain of strychnine may be added to the above. The aromatic sulphuric acid, taken as a drink, fifteen drops to the tumblerful of water, is always worthy of trial.

The use of the electromagnetic machine may be tried for the palsy; or a splint applied to the arm and hand, with vigorous friction once or twice a day, will sometimes do much for recovering the use of the muscles.

But the best remedy for the palsied muscles is iodide of potassium (146), taken freely. The sulphuret of potassa, one ounce dissolved in a quart of water, and taken in teaspoonful doses, three times a day, is also worth a trial. The affected arm should be soaked an hour, once or twice a day, in the same amount of this latter salt, dissolved in a gallon of water.

Means of Prevention. — The numerous persons who work in lead should comb their hair with a fine comb, wash their hands and face, and rinse their mouth several times a day, and also wash the whole

person with soap once or twice a week, and with clear water, or saleratus and water, once a day. Their working clothes should be of a kind to admit of being washed once or twice a week, and they should be put off for others when out of the workshop. A paper cap should be worn while at work. The food of the workmen should not be exposed to the vapors or floating particles of lead, and consequently should not be carried into the shop; and when much of the poison is floating in the air of the workroom, it is a good plan to wear a mask to prevent its being drawn with the breath into the throat and lungs.

It has been said that those who eat freely of fat meats, butter, and other oily substances, are not attacked by the disease, though exposed to the poison. I know not what protection this can give, unless the skin is in this way kept more oily, which prevents the absorption of the poison. This would seem to afford a hint in favor of anointing the whole person once or twice a week with sweet-oil.

Costiveness. — Constipation.

FEW disorders are more common than costiveness. By this term I mean a sluggish state of the bowels, which causes them to retain the fæces longer than is warranted by health. In this complaint, the discharges from the bowels are not always less frequent than they should be, but they are less in quantity, are compacted and hard, and are passed by hard straining, and sometimes with considerable pain.

Symptoms. — Headache, dizziness, feverishness, bad feelings in the head not easily described, loss of appetite, sometimes nausea, but little desire to go to stool, a weight and heaviness about the lower part of the belly, and a sense of confinement over the whole body.

Causes. — Sedentary habits, particularly when connected with close application of the mind; astringent articles of medicine; stimulating diet, composed chiefly of animal food; various diseases, particularly those of a nervous character, and especially, a neglect to evacuate the bowels at proper periods. All these causes tend to weaken the bowels, and gradually to arrest that peculiar undulatory movement, or worm-like action, called the peristaltic motion of the bowels. It is this continual contraction of the muscular fibres of the intestines from above downward, which pushes the contents steadily along; and whatever weakens the force of this vermicular play of the intestinal walls, brings on constipation.

Treatment. — One of the first things to be done is to establish the habit of *attempting* to evacuate the bowels at a particular hour every day. The best time for most persons is soon after breakfast in the morning, or just before retiring.

Use Glycones (*Lilly*). They are much better than taking medicine internally. They produce prompt, painless, and copious stools.

Diet. — To this should be added a careful regulation of the diet.

The quantity of food taken should be no greater than can be easily digested. Full meals which distend the stomach and cause it to press upon the bowels embarrass their movements. Bread made from fine wheat flour is an abomination in this disorder. Eat only that from unbolted flour. Cracked or rolled wheat, prepared as directed among dietetic preparations, is excellent for the cure of costiveness. Fresh vegetables, as peas, beans, potatoes, squashes, and ripe fruits, in their season, are all wholesome, and help to relieve costiveness. But rich pies, puddings, cakes, doughnuts, and all that sort of trash, increase the disorder.

Water Injections, etc. — One of the best remedies is water, cold or tepid, according to the condition of the patient, injected into the bowels with the fountain syringe. Syringes for this purpose may be obtained in any drug-store, and one should be in every family. Water used externally, in the form of the sponge-bath, is also useful.

Medicines. — All the above measures having failed to give relief, take Mettauer's aperient, or the neutralizing mixture. If these fail, podophyllin, etc. (36), may have a trial. A cold decoction of thoroughwort, drunk daily, sometimes has an excellent effect. It must be remembered that medicines *may* make matters worse, and they should be used cautiously. Cascara Sagrada taken in small, repeated doses, say, half a grain once, twice or more times daily till the bowels move, for some weeks, then gradually decreased, often yields excellent results. A glass of some aperient like Hunyadi Janos water, one-third glass with one-half glass of plain water on rising, will then take the place of the cascara; and finally a glass of plain water will accomplish all that previously required the use of the cascara. Daily kneading of the bowels, following the course of the large bowel, will add greatly to break up the sluggishness of the muscular atony of the bowel-walls.

Piles. — Hemorrhoids.

THERE are few complaints more common than the piles, and scarcely any which cause more trouble and misery. They consist in a fullness of blood, and languid circulation in the lower portion of the lower bowel or rectum. In consequence of this congestion, either the veins of the gut become enlarged or varicose, or the blood gets infiltrated into the cells beneath the mucous membrane, and collects, so as to form bloody tumors.

These tumors, which are seldom absent, are the leading features of the piles. They sometimes appear externally, around the anus; this is *external piles*. At other times they are within the bowel; the complaint is then called *internal piles*. They are called *bleeding piles* when blood is discharged, and *blind piles* when it is not.

Symptoms. — Usually there is a sense of weight and weakness in the lower part of the back and loins, with a painful itching about the

anus. On going to stool, there is a burning, cutting pain experienced, which is followed by bearing down and tenesmus. If it be bleeding piles, the little tumors will bleed at every motion of the bowels. There are frequently disagreeable sensations in the head, general lassitude, an irritable state of mind, and a sense of fullness and anxiety in the stomach. The pains experienced range all the way from the slightest twinges up to the most terrible sufferings, which appear like tearing the body asunder.

Causes. — Everything that irritates the lower bowel, and causes a determination of blood to the part. All drastic physic has this effect, — particularly aloes, which acts especially upon the rectum. Habitual costiveness, straining at stools, riding much on horseback, sitting a great deal, tight-lacing, high-seasoned food, and stimulation generally, lifting and carrying heavy weights, and indurations of the liver, as well as a bilious indigestion.

Females during pregnancy are much affected with piles, which are induced by the costiveness so peculiar to their condition, and by the pressure of the enlarged womb upon the veins of the pelvis.

Treatment. — This should be medicinal and dietetic.

Great care must be observed not to push medication too far. Active purging will do great mischief. Yet costiveness must in some way be corrected. For this purpose, no remedy that I have ever tried has done better in this complaint than an electuary composed of confection of senna, flowers of sulphur and cream of tartar (6), taken in doses just sufficient to procure one natural motion of the bowels each day. Pills made of extract of thoroughwort are said to do well. If the liver be in a congested state, take some of the articles recommended in the chronic inflammation of that organ.

For the local treatment, nothing is better than two ounces of lard and one dram of the flowers of sulphur mixed, and rubbed between two plates of lead until they are well blackened. This ointment is not only soothing but curative, both in the bleeding and blind piles. An ointment of almost equal excellence may be made from one handful each of witch-hazel bark, white-oak bark, and sweet-apple tree bark, boiled together in one pint of water down to one-third of a pint. Then strain, and add two ounces of lard and simmer away the water, — stirring continually before and after removing from the fire, till it cools. Witch-hazel suppositories are excellent, as is also an ointment composed of 1 ounce stramonium ointment, 6 grains pulverized opium, and 5 grains tannin.

If there is much inflammation and distress, an emollient and soothing poultice should be applied, composed of slippery-elm bark and stramonium or poke leaves. Steaming the parts is sometimes useful, by sitting over a hot decoction of hops, stramonium, and poke.

Piles may often be cured by the use of the domestic syringe. Daily

injections of cool or cold water will do much to strengthen the bowel, and restore the dilated veins to their natural condition.

The food should be of a laxative nature, corn-bread, rye-pudding, bread of unbolted wheat flour, mealy potatoes, ripe fruit, pudding and milk, buckwheat cakes, broths, and a little tender meat once a day.

When the piles are very painful an ointment of cocaine, ten grains, vaseline, one-half ounce, smeared well over them, is exceedingly grateful. Five-grain iodoform suppositories are very effective in reducing piles; its odor, however, is quite objectionable to many. Surgical treatment is often the only resource left for their cure.

Looseness of the Bowels. — *Diarrhœa*.

LOOSENESS, or relax of the bowels, is manifested by frequent, copious, and thin or unusually liquid discharges. The excessive discharge may be caused either by irritating and unwholesome food, by inflammation and ulceration of some portion of the bowels, or by debility.

Symptoms. — Rumbling noise in the bowels, with more or less weight and bearing down and uneasiness in the lower part of the bowels. This pressing down and uneasiness are relieved as soon as the evacuation takes place, but returns when another is near at hand. Griping is generally present, the strength is reduced, and the skin is pale, dry, and, after a time, sallow.

Treatment: — When the complaint is caused by irritating food, it will generally stop as soon as the offending substance is removed, and not much medicine will be required.

To neutralize any acidity, to remove wind, allay irritation, and strengthen the stomach, the compound syrup of rhubarb and potassa is well adapted, given in teaspoonful doses, every hour, till it operates. A little paragogic added to it occasionally, or essence of peppermint, or spearmint, may aid its good effects.

If nausea and vomiting are present, put a mustard poultice of one-third strength upon the stomach, and give one-tenth grain of cocaine in a teaspoonful of water every fifteen minutes. If there is much griping, give an injection (248), with twenty drops of camphor in it. A common diarrhœa may generally be arrested at once by prescriptions 159 or 162, in teaspoonful doses, after each discharge.

When there is inflammation and ulceration of the bowel, the treatment must be similar to that for dysentery, — fomentations externally, and the occasional use of starch injections, mild cathartics (9), (10), and poultices externally.

Chronic Diarrhœa.

THE acute form of diarrhœa, not being properly managed, often runs on, and becomes chronic, and is at times exceedingly difficult to cure.

Symptoms.—Frequent discharges, generally with some pain and griping, restlessness, thirst, poor appetite, debility, loss of flesh, dry, rough, and somewhat sallow skin, and tongue dry and dark-colored. The food often passes through the bowels pretty much in the condition in which it was swallowed. The liver is generally out of order, and the bowels are frequently afflicted with a low grade of inflammation.

Treatment.—In this form of the disease, astringents and tonics will generally be required. Sometimes a teaspoonful of brandy, in a little sweetened water, or in clear water, several times a day, will effect a cure. Good cherry brandy is a valuable remedy; so is black-berry brandy. Many of the worst cases have been cured by taking no nourishment, for a long time, except milk, with a little lime-water in it.

When the liver is involved in the complaint, as evinced by light-colored stools, leptandrin, geranium, etc. (341), may be given with advantage.

In some instances, when there is considerable debility, pills of quinine, catechu, etc. (342), will do well.

A sponge-bath must be taken daily, and the skin be well rubbed after it.

Cholera Morbus.

THE above name is given to a disease common in warm weather, and characterized by sudden attacks of bilious vomiting and purging, with severe pain in the belly, cramps, and general fever and subsequent prostration. The great amount of bile secreted and discharged has given it the name *cholera*, from *cholos*, bile.

Symptoms.—The disease begins by sickness and distress at the stomach, which is succeeded by violent gripings, with vomiting of thin, dirty-yellowish, whitish, or greenish fluid, with discharges from the bowels similar to that vomited. The nausea and distress, with some few exceptions, continue between the vomiting and purging, and the pain, at times, is intense. The pulse is rapid, soon becoming small and feeble, the tongue dry, the urine high-colored, and there is much thirst, though no drink can be retained on the stomach. It is to be distinguished from diarrhoea by the *bilious* discharges.

Treatment.—Apply a large mustard poultice over the stomach and liver, and give tablespoonful doses of compound powder of rhubarb and potassa, every half hour, until the vomiting and nausea are checked, adding to each dose five to ten drops of camphor, if necessary. Perhaps it would generally be best, however, to give liberal draughts of warm water, at first, or flax-seed tea, that all the solid contents of the stomach and bowels may be washed out.

A teaspoonful of laudanum in a wine-glass of flax-seed tea, given as an injection, every two hours, will sometimes do excellently well;

or a tea made of chamomile flowers, or colombo, and made sour by a few drops of nitric or sulphuric acid, and given internally, will sometimes succeed better than most other things. One grain of svapnia and thirty grains of bicarbonate of soda dissolved in an ounce of sweet tincture of rhubarb, and given in teaspoonful doses, every half hour will often have a fine effect. The prescription 162 is also valuable.

Hot-water bags should be applied to the feet, and warm flannels, or other kinds of dry heat, to the whole body.

Asiatic Cholera.

BESIDES the above name, this fearful disease has been called epidemic cholera, malignant cholera, spasmodic cholera, and cholera asphyxia. It first attracted notice in Bengal in 1817, whence it spread westward through Europe, and in 1832 it reached Quebec, on this continent. It has since then visited Asia and Europe several times with great severity, and has even been present on our shores. But at the present day the strict vigilance of sanitary boards has done much to prevent its spread and mitigate its terrors. Through the investigations of Koch and others it is now known to be propagated by a microbe, called the comma bacillus, and the efforts of investigators is now being directed to the discovery of an agent that will destroy this germ and thus control the disease.

Symptoms.—First Stage.—The first, premonitory stage, is marked by derangement of the digestive organs, rumbling in the bowels, pain in the loins or knees, twitching of the calves of the legs, impaired appetite, thirst, and especially, a slight diarrhoea; and these symptoms continue from a few hours to several days. I should add to these symptoms what is said to have been recently discovered, namely, that for several days before the attack, *the pulse is down to forty or fifty beats in a minute*. This, if it prove to be reliable, is a very valuable symptom.

Second Stage.—This stage is marked by vomiting and purging a thin, colorless fluid, looking almost exactly like rice-water; by severe cramps in the calves of the legs, which soon attack the bowels and stomach. These cramps are excessively painful, and draw the muscles into knots. The tongue is pale and moist; the pulse feeble, though sometimes full and firm; the breathing hurried, with distress about the heart; great thirst; a feeling of internal warmth, and the secretion of urine entirely stopped.

These thin, colorless discharges by vomiting and purging, are the serum or watery portion of the blood, which oozes through the sides of the blood-vessels, and runs off rapidly, leaving the crassamentum, or red, solid part of the blood, stranded upon the inner surfaces of the arteries and veins. When so much of this is discharged that the blood cannot circulate freely, the patient sinks into the

Third Stage, which is characterized by great prostration; pulse hardly perceptible; skin cold and clammy; face blue or purple, and eyes much sunken; hands dark-colored and sodden, looking like a washerwoman's; breathing short and laborious; a sense of great heat in the stomach; and intense thirst. Recoveries from this stage seldom take place.

Treatment. — In the first stage, the diarrhœa should receive the most prompt attention. From five to ten drops of laudanum, repeated a few times, every three hours, will generally put a stop to it. Catechu (162) is also a suitable remedy. The compound syrup of rhubarb and potassa, with some other articles (343), in tablespoonful doses, every hour, till it operates gently, is worth a trial. The diet should of course be very carefully regulated at such a time, though not particularly changed, except to leave off any indigestible article which is known to be injurious, and to be made a little more sparing than in time of perfect health.

When the second stage has set in, or the stage of vomiting, purging, and cramps, the treatment must be energetic. The sinking powers must be sustained by chloroform, opium, and ammonia (119), or by camphor, opium, and cayenne (344), giving one pill every hour. Brandy may also be given freely.

The warmth of the surface must be promoted by all possible means, hot bricks and bottles, tincture of cayenne, friction, etc.

In the third stage, the remedies recommended above are to be pursued with increased energy, particularly the stimulants, and the efforts to promote the warmth of the surface.

Dysentery. — Bloody Flux. — *Colitis*.

THIS is an inflammation of the mucous membrane lining the lower or large bowels. The small bowels begin at the stomach, and are eight or ten yards long; being largest near the stomach, and diminishing in size as they approach their termination in the cæcum. The lower or large bowels are two or three times as large as the small ones, and from their junction with the latter, they extend about six feet to the outlet, or *anus*. The large bowels are composed of the cæcum, the colon, and the rectum. The rectum is about one foot in length.

In most cases of dysentery, the rectum, and about half the adjoining portion of the colon, experience the chief force of the inflammation. Sometimes the whole of the colon and cæcum are affected. Sometimes the mucous membrane lining these is ulcerated, and, becoming wholly disorganized, passes off in shreds.

Symptoms. — The disease comes on with loss of appetite, costiveness, lassitude, shivering, heat of skin, and quick pulse. These are followed by griping pains in the bowels, and a constant desire to pass

their contents. In general the passages are small, composed of mucus mixed with blood. These passages are attended and followed by severe gripings and inclination to strain, learnedly called *tormina*, and *tenesmus*. They are sometimes, in the early stages, attended by nausea and vomiting. The natural feces, which do not pass off much, are small in quantity, and formed into round, compact balls, or irregular, hardened lumps. This tenesmus, or great desire to strain, will continue, perhaps increase, for several days—the discharges being mostly blood in some cases, and chiefly mucus in others. Having generally but little odor at first, these discharges become, as the disease advances, exceedingly offensive.

Causes. — Dysentery is very frequently caused by sudden changes from hot to cold, by which sweating is suddenly checked, and the blood repelled from the surface. Hot climates, and dry, hot weather are predisposing causes. All green, unripe, and unwholesome food, and indigestible food of every sort, may induce it.

Treatment. — In mild cases give a tablespoonful of castor-oil and two teaspoonfuls of paregoric, mixed, once a day. Sometimes, in place of the above, a dose of rochelle powder, dissolved in water, and eleven or twelve drops of camphor, may be taken. A moderate quantity of flax-seed or slippery-elm tea, may be taken as a drink, and the bowels be well emptied by an injection of starch.

For this type of diarrhoea as well as for most of those that precede it the following prescription is most valuable: Subgallate of bismuth, 4 drachms or teaspoonfuls, salol, $\frac{1}{2}$ drachm, paregoric, 6 drachms, tincture of camphor, 2 drachms, compound tincture of cardamon, 3 ounces. A teaspoonful in a little water every three hours.

The patient should not be allowed to sit up, and must be kept very still, and be allowed only a very scant diet, as flour porridge, well boiled, rice water, etc.

Chronic Dysentery.

WHEN dysentery “runs on” for some time, it is liable to become *chronic*.

Symptoms. — Looseness of bowels, — the discharges being unhealthy, more or less bloody, attended by bearing down, or a desire to strain, and being in number from two to forty a day. There is great debility, the pulse is weak and quick, the tongue slightly furred, the appetite lost, the face pale and sallow, the skin dry and parched. Sometimes the relax alternates with costiveness.

Treatment. — In this form of the complaint, astringents will be necessary (159), (161), (162), (345), (346), (347).

Injections may be used, if necessary, composed of nitrate of sil-

ver, two grains to the ounce of water, or an infusion of golden seal, with a little tincture of prickly-ash berries added to it.

The diet must be very light, easy of digestion, and nutritious. In some cases, it should be composed chiefly of wheat porridge, or boiled milk and boiled rice. In other cases, a little tender beef-steak should be taken once a day.

Worms. — *Vermes*.

THE intestinal canal is subject to various disturbances from the presence of worms. Of these troublesome tenants, there are three principal varieties.

The Ascaris, or *pin-worm*, called also maw or thread worm, is a small, white, thread-like worm from half an inch to an inch in length. These worms live, in great number, in the rectum, where they excite great irritation and itching.

The Lumbricus, or *ascaris lumbricoides*, is a round worm, about an eighth of an inch in thickness, and from an eighth to a quarter of a yard in length. Its color varies from a milky whiteness to a deep red. It generally occupies the small bowels.

The Tenia Solanum, or *tape-worm*, is a flat worm, with four suckers at the head, is from a few feet to some hundreds in length, and full of joints. It dwells in the small bowels, and feeds on the chyle as it comes along, before it is absorbed by the lacteals. In this way, it robs the body of nourishment, and produces great loss of flesh, and an enormous appetite.

Symptoms. — In the grown person the symptoms of worms are quite obscure, except an intolerable itching within the anus, which generally indicates pin-worms.

In children worms are indicated by paleness, itching of the nose, grinding of the teeth and starting in sleep, irregular appetite, bad breath, swelled upper lip, picking of the nose, hard swelled belly, and one cheek constantly flushed.

Treatment. — For expelling worms various articles have been used. Among these spirits of turpentine (155) has a high reputation. The following preparation does well: Spirits of turpentine, half an ounce; essence of anise, half an ounce; castor-oil, one ounce; worm-seed oil, two drams. Mix. The dose for a child one or two years old is ten to twenty drops, every two or three hours. In two or three days, a brisk physic should be given. The worm-powder is quite successful.

An injection composed of quassia, or aloes, or of simple sweet-oil, is very effectual in removing pin-worms from the lower bowel. So is an injection composed of the red iodide of mercury, one grain; iodide of potassium, half a grain; and two pints of water.

Most of the above preparations are thought to be successful in expelling all kinds of worms; but for the *tape-worm*, no other remedy has yet shown itself as effectual as *pumpkin-seeds*. The seeds should be well bruised, and steeped in water. This should be drunk freely for several days, if need be. It is believed to be a sure remedy, even in cases of several years' standing. The expulsion of a worm may be hastened by having a movement over a vessel in which a quart or so of boiling water has been placed, which will have a tendency to relax parts so that the worm will loosen his hold the more readily. The drinking of the decoction of pumpkin seeds should be followed after an interval of an hour or so by a good saline cathartic, such as one or two teaspoonfuls of epsom salts.

In all cases of worms, the diet should be carefully chosen, and be connected with proper exercise, pure air, frequent bathing, and all those measures which tend to improve the general health.

After the expulsion of the worms, tonics should always be taken to strengthen the bowels, that the same evil may not return.

Acute Inflammation of the Kidneys. — *Nephritis*.

BEFORE speaking of this disease, I wish to give the reader a general idea of a kidney, and shall do so by the use of two cuts.

Fig. 110 presents the external surface of the right kidney, with its renal capsule mounted on top; *i*, being its upper edge; *f*, *h*, superior and inferior branches of the emulgent artery; *c*, *d*, *e*, three branches of the emulgent vein; *a*, the pelvis of the ureter; *b*, the ureter.

Fig. 111 is the same kidney laid open; 1, being the super-renal capsule; 2, the vascular portion; 3, 3, the tubercular portion, consisting



FIG. 110.

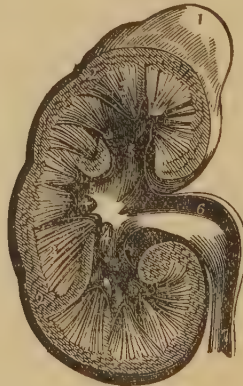


FIG. 111.

of cones; 4, 4, two of the calices receiving the apex of their corresponding cones; 5, 5, 5, the three infundibula; 6, the pelvis; and 7, the ureter.

The kidneys are glands, and their office is to draw or strain off

from the body those effete or worn-out particles, or *products of decay which contain nitrogen*, while the *liver* takes away those *carbonaceous matters which have no nitrogen*. These useless substances which go out through the kidneys are generally in the form of urea. In carrying off these matters, the kidneys may have more to do than properly belongs to them; and may be so stimulated, or irritated, or injured in some way, as to become inflamed.

Symptoms.—Like most other inflammatory diseases, it begins with cold chills and rigors, especially in the back and loins, followed by fever and pain. The pain frequently extends to the bladder, the loins, and the thighs, and is of a severe, lancinating kind—though sometimes obtuse. Pressure, motion, straining, or taking a full breath, add to its pungency. The urine is scanty, high-colored, sometimes bloody, and can only be passed drop by drop. In the loins there is a sense of heat, gnawing, and constriction; the bowels are either constipated, or relaxed by diarrhoea. A numbness of the thigh, and drawing up of the testicle on the affected side, are marked and peculiar symptoms. In some cases, there are nausea, vomiting, oppression of the stomach, faintness, hiccough, drum-head distention, and rumbling of the bowels. The skin is hot and dry, the pulse hard and frequent.

Causes.—The use of cantharides, oil of turpentine, and other diuretics, taking cold, violent exercise, mechanical injuries, the translation of rheumatism or gout, the striking in of skin eruptions, and gravelly formations in the kidneys or ureters.

Distinctions.—This disease is to be distinguished from *colic* by the pain being increased by pressure, and by the frequent but difficult discharge of red urine; from *lumbago*, from its being confined frequently to one side, and also by the urinary troubles, and by the nausea and vomiting; and from all other diseases, by the numbness of the thigh, and the drawing up of the testicles.

Terminations of the Disease.—It runs a rapid course, and may terminate by resolution, or by suppuration. When the latter happens, it is indicated by the decline of the more violent symptoms, a throbbing and a sense of weight, with chills, followed by flushes of heat, and sweating. The matter formed, generally small in quantity, may pass into the cavity of the kidney, and thence through the bladder to a natural outlet with the urine.

Treatment.—Either put the feet into a hot mustard-bath, or put mustard drafts upon them. At the same time apply a large mustard poultice upon the small of the back, and follow it up with hot fomentations of stramonium leaves and hops, or stramonium and wormwood or tansy.

Let perspiration be induced as soon as possible by five to ten-drop doses of tincture of *veratrum viride*, repeated every hour, or by teaspoonful doses of the compound tincture of Virginia snake-root, given every half hour.

If costiveness exist, the bowels must be opened by epsom salts, cream of tartar, or salts of tartar; or by copious injections of warm water, containing a few drops of the tincture of arnica-leaves. Such injections not only unload the bowels, but act as a local bath, by lying in the bowel near the inflamed kidneys.

The drinks must be mucilaginous and diuretic. The marshmallow root and peach-leaves, slippery-elm bark, flax-seed, mullein, elder blows, hair-cap moss, and cleavers, are all valuable. If the disease is caused by gravel, twenty drops of liquor potassæ, largely diluted with flax-seed and upland-cranberry tea, and taken freely as a drink, is excellent. We recommend Poland water in large quantities.

Chronic Inflammation of the Kidneys.

THIS is frequently the result of the acute form of the disease, but is also produced by injuries and other causes.

Symptoms. — A weakness in the small of the back, and a dull, heavy pain in the kidneys. The urine is passed often and in small quantities. It is alkaline — sometimes white and milky — and has in it deposits of phosphate of lime, and triple phosphates.

Treatment. — Infusions of pipsissewa, uva ursi, trailing arbutus, wild carrot, queen of the meadow, buchu-leaves, or foxglove are useful diuretics, and may be taken with advantage.

The bowels must be kept open with some gentle physic (18), if they are costive; and the alkaline sponge bath, with friction, be used daily.

An eruption may be brought out upon the small of the back by rubbing on a few drops of croton-oil; or, if the patient prefer it, a mustard poultice may be applied two or three times a week.

The food should be nutritious, and easily digested, and a little exercise be taken daily in the open air.

Acute Inflammation of the Bladder. — *Cystitis*.

THIS disease affects the lining membrane of the bladder, — sometimes its muscular substance. It may attack the upper portion, the middle, or the neck of this organ. It runs a rapid course.

Symptoms. — Burning, piercing, and throbbing pain in the region of the bladder. The pain extends to the perineum, and in some cases, to the testicles and thighs, and is much increased by pressure. The perineum, the space between the fundament and testicles, feels sore to the touch. The desire to pass urine is incessant, but the effort to do so is mainly ineffectual. The water passes off drop by drop, with great pain, or is entirely stopped, causing enlargement of the bladder, and great distress. Mucus from the inflamed lining of the bladder passes off with the water. Nausea, vomiting, and

great anxiety are common. The bowels are bound, and when the disease is on the side next the lower bowel, there is a desire to empty the bowels; and if the inflammation be in the neck, there is great pain in the perineum, and frequently an entire retention of the water. The pulse is full, hard, and frequent, the skin hot and dry, the thirst urgent, and the patient restless and dejected.

Causes.— This disease may be produced by taking cantharides and turpentine; by irritating substances forced into the bladder with a syringe, or by pushing bougies or catheters into it; by gravel-stones in the bladder; by retained urine; by external injuries; by gonorrhœa; and by cold applied to the feet, or to the lower portion of the abdomen.

Treatment.— If the urine be retained, it is of the utmost importance that it be early drawn off with the catheter, lest a distention of the bladder bring on mortification. Great care is required not to produce irritation by any roughness in introducing the instrument.

Poultices should be applied upon the lower part of the bowels and perineum. Cold compresses will often do as well. The bowels must be opened with epsom salts. Injections of warm water, with a few drops of tincture of arnica-leaves, will act finely as a local bath, — the water being retained as long as possible.

The tincture of veratrum viride will be required in five to ten-drop doses, or the compound tincture of Virginia snake-root, to induce perspiration. Ex. jaborandi may sometimes be used for the same purpose.

Drinks must be taken very sparingly. A small amount of cold infusion of slippery-elm bark, or marshmallow and peach-leaves, or cleavers. This mucilaginous drink must be the beginning and the end of the diet during the active stage of the disease. Alkalis are exceedingly useful in allaying the pain and smarting of urination, perhaps the best remedy being liq. potass. citratis, in tablespoonful doses every two hours. Suppositories of opium and belladonna in one-fourth grain doses by the rectum every two to four hours allay the frequent urination and pain and quiet the spasm of the neck of the bladder.

Chronic Inflammation of the Bladder.— *Cystirrhœa*.

THIS is much more common than the active form of the disease. It often arises from the same causes which produce acute inflammation of the bladder.

It often passes under the title of “catarrh of the bladder.” It is a chronic inflammation of the mucous lining of that organ, and is a very common and troublesome affection among old people.

Symptoms.— Slight lancinating pains, with a feeling of heat in the region of the bladder, and a sense of weight and tenderness in the

perineum; frequent and tormenting desire to pass water, with occasional spasmodic action of the bladder. The urine is loaded with tenacious mucus, just as the expectoration has large quantities of mucus in it when there is inflammation of the membrane lining the windpipe and bronchial tubes. When the water has stood a while, this mucus settles at the bottom of the vessel, leaving the fluid clear above. Great quantities of this are sometimes passed, — amounting even to pints in a day. The triple phosphates of magnesia and ammonia are often found in the water.

Frequently there are derangements of the appetite and digestive functions, a white or brown fur upon the tongue, a harsh, dry skin, with thirst and general debility, — especially in the back and loins. Sometimes there is a little fever.

Treatment.—To reduce the inflammation apply a mustard poultice. Urotropin in powder form, 7 grains to a dose or the tablet of $7\frac{1}{2}$ grains may be used as they are more readily bought, followed by a good drink of water and taken three or four times a day is the best drug to clear the urine of pus or other debris caused by inflammation of the bladder.

An injection into the bladder, once a day, of a tepid infusion of golden-seal root, with much care, may be of great service; or an infusion of equal parts of golden-seal, witch-hazel, and stramonium. It may be done with a gum-elastic catheter and a small syringe.

The bowels must be kept open with the neutralizing mixture, or some other mild physic; and the skin bathed with saleratus and water once a day, and rubbed well with a coarse towel.

Should there be any scrofulous, or gouty, or rheumatic condition of the system, the remedies for those complaints may be used in addition to the above.

Milk, bread and vegetable food should be the only articles of diet allowed.

Disease of the Supra-Renal Capsules.

THE supra-renal capsules are small bodies situated above the kidneys. (Fig. 111, 1.) Their office is not well understood. It has been found of late that they are subject to a disorder having peculiar symptoms. This is a comparatively new disease.

Symptoms.—The most marked symptom is a peculiar change in the color of the skin, called “bronzing.” This bronzing process begins in patches on those parts exposed to the sun, and to friction, as the neck, the backs of the hands, the fronts of the thighs, and the arms. These patches look, in color, like spots upon a bronze statue, deprived of their gloss.

Another marked symptom is a general *debility*, which comes on without any apparent cause, — there being, generally, no evidence of organic disease, and no loss of flesh, — and is attended with faint-

ings, loss of energy both of body and mind, a peculiar flabbiness of flesh, and an early death, apparently from sheer weakness.

The blood becomes depraved, and loses its coloring matter, as shown by the paleness of the skin where there is no bronzing.

The pulse is generally very soft and compressible. The stomach is irritable, the appetite is gone; there is nausea and sometimes vomiting, with pain and a sense of sinking at the pit of the stomach. Frequently there is costiveness, sometimes diarrhoea, and pains in the back and loins. In some cases there are epileptic fits, failure of memory, change of temper, or a numbness of the fingers, legs, etc.

Treatment.—The only method of treatment that promises any hope of cure in this trouble is a preparation made from healthy *Suprarenal Capsules*. These are concentrated and undergo a process which enables the important elements to be retained and a fair proportion of cases are now cured by their use.

Bright's Disease of the Kidneys. — *Albuminuria*.

THIS peculiar disease was first explained to the profession in 1837, by Dr. Bright, of England, whose name it took. It consists of a disorder of the kidneys, — probably a congestion and an obstructed circulation in them, from which arise two most important effects; first, albumen, an essential alimentary constituent of the blood, is secreted and passed off, in larger or smaller quantities, in the urine; and secondly, urea, the worn-out matters of the blood which the kidneys are made expressly to carry off, is permitted to remain. If the urine of a person having Bright's disease be examined, therefore, albumen, which should *not* be there, will be found, and urea, a natural constituent, will be absent. The presence of albumen, however, while abnormal, is not necessarily indicative of Bright's disease, as it may proceed from indigestion and blood disorders.

Method of Examination. —To discover albumen in urine suspected to contain it, place a little in a test tube, and boil it over a spirit-lamp. If albumen be present only in minute quantity, it may cause only a delicate opalescence; if in larger quantity, it may separate in curdy flakes, and fall to the bottom as a more or less abundant white precipitate. If *very abundant*, the liquid may become nearly solid.

The albumen is the same as the white of an egg, and the boiling has the same effect in whitening and hardening it, as upon that substance.

Albumen is sometimes found in the urine in a coagulated state, and having the shape of tubes or worms (Fig. 112). This is quite common in Bright's disease. The deposit seems to be made up of fibrous casts of the uriniferous tubes of the kidneys.



FIG. 112.

Symptoms.—The two unnatural conditions mentioned above give rise to the symptoms of Bright's disease. One of them, however, is itself the most constant and characteristic symptom of the disease, namely, the presence of albumen. This, too, being one of the nutritive constituents of the blood, its abstraction thins the serous portion of the blood, and causes it to filter out of its vessels into the cells,—causing dropsy of the cells, usually called cellular dropsy, or anasarca. This general dropsy begins frequently in the face, and spreads rapidly over the whole body and limbs. In addition to this, there are pains in the back and loins, a gradual failing of strength, and a derangement of digestion. The skin becomes dry, with a pale and bloodless appearance, and there are frequently thirst, nausea and vomiting. The urine frequently has fat, blood, epithelial scales, mucus, blood-discs, fibrous casts of the uriniferous tubes, and saline sediments; and is generally lighter by weight than in health, and less in quantity, and is apt to be red, brown, or dingy in color.

The retention of urea in the blood acts as a poison, and causes, toward the latter end of the disease, when accumulated in large quantity, drowsiness, convulsions, and apoplexy.

A frequent desire to make water, with a shifting back and forth of the bowels between costiveness and diarrhœa, are common symptoms.

Treatment.—The results of treatment in this disease are often unsatisfactory. Yet if taken in season, investigated with proper care, and treated with due diligence, much may be done for its cure. It is one of those harassing complaints, which physicians in family practice seldom have the patience to investigate and manage with sufficient care.

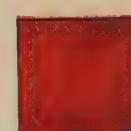
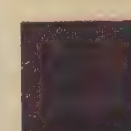
Let the healthy and active condition of all the vessels of the skin be the first object aimed at. This will relieve the laboring and faltering kidneys of a portion of their burden. The alkaline sponge-bath with vigorous friction every day will secure this object.

In the next place, the skin being put in a working condition, should be made to work by some internal diaphoretic,—as the tincture of *veratrum viride*, in doses of from five to ten drops, or the compound tincture of *Virginia snake-root*, in teaspoonful doses.

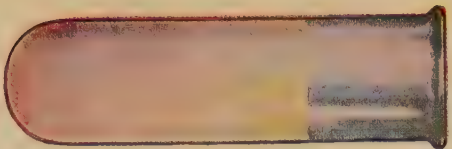
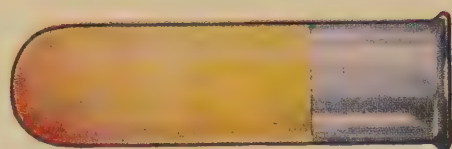
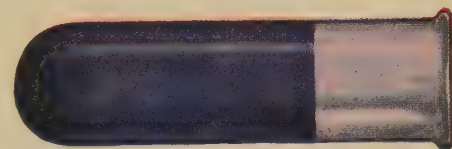
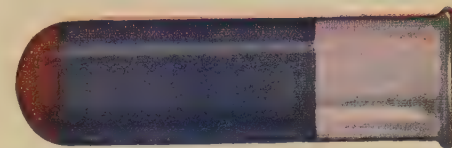
The kidneys may be still further relieved, especially when there is considerable tenderness and other signs of inflammation, by applying mustard poultices and croton oil externally.

The bowels should be regulated by some gentle physic, as cream of tartar dissolved in flax-seed tea, rochelle powders, epsom salts, etc. In some cases, *podophyllin* and *leptandrin* (40), or the compound powder of *jalap* (41), are useful.

When there is dropsy of the cells, *elaterium* may be used as physic (31), or the kidneys may be jogged by *digitalis* (130), (129), its effects being carefully watched. Cider, freely drunk, has been found useful in some cases.

Normal		Pale Yellow
		Light Yellow
		Yellow
		Reddish Yellow
Concentrated		Yellowish Red
		Red
		Brownish Red
		Reddish Brown
Severe Inflammation		Brownish Black

SIMPLE HOME TESTS FOR URINE

1		Normal Urine
2		Test for Albumen (showing absence)
3		Test for Albumen (showing presence)
4		Test for Sugar (Negative) (showing absence)
5		Test for Sugar (Positive) (showing presence)
6		Brick Dust Sediment
7		Test for Indican (Negative) (showing absence)
8		Test for Indican (Positive) (showing presence)
9		Bilious Urine

Tube No. 1 showing Normal Urine. Boil urine in which has been dissolved a little salt; if it becomes cloudy albumen or phosphates are present. Add a few drops of acetic acid and if cloud disappears it is phosphates (Fig. 2); if it remains it is albumen (Fig. 3). See page 372.

Tube No. 2 and 3 showing Test for Albumen. For directions see page 373.

Tube No. 4 and 5 showing Test for Sugar. See page 381.

Tube 6 showing Brick Dust Sediment or Uric Acid. To a teaspoonful of hydrochloric acid add one drop of nitric and 15 drops of urine and stir. In 5-20 minutes a distinct amethyst color denotes normal amount of indican. A deep violet, coming quickly, shows increase. Indican shows putrefaction somewhere in the body, usually intestinal. See page 393.

Tube 9 shows Bilious Urine.

Physical Appearance of Urine in Health and Disease

A peculiar appearance of the urine is one of the first symptoms noticed in inflammations of the urinary tract. These physical signs embrace deviations from the normal in amount, color, odor, consistency, transparency, reaction, and specific gravity, and any variance, except transitory, should at once send the observer to the family physician for a thorough chemical and microscopical examination.

I. **Amount.** *Normal*, $2\frac{1}{2}$ – $3\frac{1}{2}$ pints. More in men than women. *Increased* by cold; by drinking fluids; in diabetes; in some nervous diseases like hysteria and convulsions; in apoplexy, convalescence from acute and inflammatory diseases, and in enlargement of the heart. *Decreased* by heat; in fevers, shock, stoppage due to heart disease, acute congestion of the kidneys; in diseases accompanied by purging and vomiting, in all forms of Bright's, except chronic diffuse and interstitial kidney trouble; and in all diseases before death. *Stoppage* is caused by obstruction in the bladder or urethra.

II. **Color.** *Normal*—Light yellow, straw or amber tint; varies in health according to amount of fluids drunk, and perspiration. *Pale* in diabetes, hysteria, interstitial nephritis. *High-colored*, usually concentrated. (An exception, however, is the urine of sugar diabetes, which, though very pale, has a high specific gravity due to the presence of sugar.) Occurs in acute fevers and inflammation. *Reddish* color always shows the presence of abnormal coloring matter, usually blood. *Brown* urine occurs after taking rhubarb or senna; *yellow*, santolin; *blue* after methyl. A *dark-brown* color may be the sign of hemorrhage from the kidney. *Smoky* urine follows the use of carbolic acid and allied drugs. Urine which turns *greenish* on standing contains bile-pigments. In cancer the urine becomes almost *black* on standing; in typhus and cholera, *blue*.

III. **Odor.** *Normal* urine has a peculiar, aromatic, or "urinous" odor; most perceptible in concentrated urines. On standing it becomes *putrid* and *ammoniacal*; fresh urine which has these characteristics is symptomatic of bladder trouble. A *fecal* odor denotes a fistule between the urethra and rectum. Vegetable foods and drugs may change the odor; turpentine gives the odor of *violets*; asparagus, turnips, cubebs, copaiba, sandalwood, etc. producing their own peculiar odors. Diabetes urine smells "*sweet*." Pus in the bladder gives off a particularly *foul* smell like that of *sulphur*.

IV. **Consistency.** *Normal* consistency is that of water. It becomes *thick* and *stringy* on standing, especially after it has become alkaline. Urine containing much sugar or albumen tends to become *frothy*. Chylous urine contains fat in emulsion and is consequently *thickened* somewhat.

V. **Transparency.** *Normal* urine freshly passed is always clear, but on standing, a faint cloud of excrete matter floats near the centre and finally settles near the bottom. This is more pronounced in women, and is always *increased* in cystitis, prostatitis, urethritis and other catarrhal conditions of the urethral tract. (It is distinguishable from other cloudy substances by the fact that it tends to float in the centre of the fluid, and is precipitated by an excess of acetic acid.) *Turbid* urine is due to bacteria, phosphates, water, or pus. That due to *bacteria* is not cleared up with acetic acid. *Turbidity* due to *phosphates* is uniform throughout the fluid and is cleared up by a few drops of acetic acid. *Urales* cause a deposit to settle quickly from cold urine which may be white, pink, dirty yellow, or brick red in color, and is dispelled by heating. *Pus* causes an opaque cloud to form, which after a few minutes settles to the bottom. The different forms of turbid urine are easily **determined by following the above directions.**

VII. **Specific Gravity.** *Normal* varies in health between 1.012–1.024; in disease between 1.002–1.060. Normal average 1.020 in adults; 1.021 in children. Determination of specific gravity should be made from 24 hours' urine. (For method, see page 379). *Increased* at the beginning of acute fevers, after long operations, in the early stages of acute Bright's and when there is blood in the urine. In sugar diabetes it may reach 1050. *Diminished* in simple diabetes, in hysteria, chronic interstitial nephritis, in all forms of Bright's, except the first stage of acute, and in all forms of impaired circulation due to heart disease. It is a serious sign in chronic Bright's when marked.

VI. **Reaction.** *Normal* urine is slightly acid, except in three or four hours after a meal when it is alkaline. Acidity is *increased* by a red-meat diet and by concentration. Acidity is *diminished* by obstruction and inflammation of the urinary tract. An alkaline is only of importance in freshly-passed urine, although the rapidity with which it grows alkaline when protected from heat and bacterial contamination is important. In testing the reaction (see page 379) watch the red litmus paper which has been turned blue; it will regain the red color if the alkaline is *volatile* as in the case of urines which have undergone fermentation.

To restore the blood, iron (73), (93), (74), (75), (72), (71) is the essential article. When there is considerable debility, some of the vegetable bitters, as quinine, quassia, gentian, colombo, etc., may be used daily.

Coffee, and all indigestible articles of food, as rich pastries, new bread, high-seasoned meat, and fats, must be avoided, — in a word, nothing must be taken, either in kind or quantity, which the stomach cannot easily digest.

Diabetes.

A CHRONIC disease of mild beginning which is associated with the presence of a large amount of sugar together with a great increase of the amount of urine passed. The usual amount that a healthy adult passes during the day is three pints and this disease may cause an increase in severe cases to several quarts; three to four quarts is not unusual and it can be noticed that this great waste of the tissues must naturally be associated with considerable loss of flesh and strength. It is a disease most often found in middle life and more common among men than women and is quite frequently passed down through generations.

Nature of the Urine.—Not only is there too much urine discharged, but, instead of being lighter than healthy urine, as in Bright's disease, it is heavier, and instead of holding albumen in solution, it contains *grape-sugar*.

To Detect Sugar.—Put a little of the suspected urine in a test-tube; add to it a drop or two of solution of sulphate of copper, which will give the fluid a pale-blue tint. Now add liquor potassa in excess: if sugar be present, this will throw down a pale-blue precipitate (hydrated oxide of copper), which will immediately re-dissolve, forming a purplish-blue liquid. Boil this over a lamp; if there be sugar, a reddish or yellowish-brown precipitate (sub-oxide of copper) will be thrown down; if no sugar, a black precipitate (common oxide of copper) will fall to the bottom.

Another Test.—Place a little urine in a test-tube; add to it half its volume of liquid potassa, and boil five minutes. If there be sugar present, the liquid will take a brownish or bistre tint.

Growth of Torula as a Test.—Place a portion of saccharine urine in a warm place, and a scum will soon rise, as if a little flour had been dusted on it. This, when examined under the microscope, proves to be minute oval bodies. These expand and dilate the vesicle containing them into the form of a tube. They still continue to enlarge, and project from the parent bladder, like buds. The whole then resembles a jointed fungoid growth (Fig. 113), which finally breaks up, and falls to the bottom, as a copious deposit of oval vesicles or spores.



FIG. 113.

Other Symptoms. — Great thirst, craving appetite, dry skin, a sense of weight and uneasiness in the stomach after eating, dry and parched mouth, white and foul or clean and red tongue, wasting of flesh, languor and aversion to exercise, debility, pain and weakness in the loins, costiveness, loss of the sexual feeling, and cold feet. As the disease draws towards a fatal end, the gums become spongy, the breath fetid, sometimes smelling like urine.

Treatment. — The skin should have about the same treatment as that recommended in Bright's disease. Also, the same counter-irritation over the kidneys. The bowels must be kept open by some gentle physic (13), (12), (15).

Tonics. — These will be required to restore the tone of the system, particularly iron, — same preparations as recommended in Bright's disease.

Astringents to check the flow of urine will be needed. Alum, in three-grain doses, three times a day, or sugar of lead, or white vitriol, or clear opium, will be serviceable. Creosote, in one or two-drop doses, and tincture of cantharides, have each cured cases.

One scruple of Peruvian bark, one scruple of wild-cranberry leaves, powdered, and half a grain of opium, mixed and taken three times a day, is a good remedy.

All articles which contain sugar and starch must be forbidden in the diet. Bread and potatoes contain a large amount of starch; and beets, parsnips, and some other vegetables, have sugar. It is best to confine the patient almost entirely to tender, fresh meats; and the drink, notwithstanding the great thirst, must be restricted to a *very small quantity*. Saccharin should be used to sweeten drinks instead of sugar.

Bleeding from the Kidneys, etc. — *Hæmaturia*.

By this I mean a discharge of blood from the urinary passage. It may come from the kidneys, the ureters, the bladder, or the urethra.

Symptoms. — The passage of the blood is preceded by pain in the region of the bladder or kidneys, and accompanied by faintness. There is generally heat and distress in the loins, and tenderness upon pressure in the region of the bladder or kidneys, according to the place from which the blood comes.

It is sometimes difficult to decide whether the coloring matter in the urine is really blood. In such cases, the microscope will generally detect the blood corpuscles, if present. They commonly appear as in Fig. 114, having a yellow color, and being pretty uniform in size.

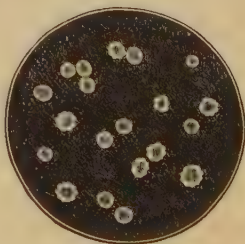


FIG. 114.

Treatment.—This must of course vary according to the nature of the case, and the immediate cause producing it. Where active bleeding exists, the patient must have absolute rest in bed, with applications of cold to the hips, and the bowels must be freely moved with some preparation of salts (14), (18), (20), (25).

Sugar of lead is a valuable remedy; but it should be given in large doses for a short time, rather than in small doses for a long time. It is best taken in form of solution (348), two great spoonfuls every two hours, until five or six doses are taken.

But the best remedy is *gallic acid*. It seems to have extraordinary power in this complaint. It should be given in five-grain doses, mixed with a teaspoonful of mucilage of gum-arabic, and ten drops of tincture of henbane.

Suppression of Urine. — *Ischuria Renalis*.

THIS disease is, in one respect, just the opposite of diabetes. While immense quantities of urine are secreted in that, none is secreted in this. In that, the kidneys do too much; in this, they do nothing.

This complaint is sometimes called paralysis of the kidneys. It usually occurs in old persons, and those inclined to corpulency.

Symptoms.—The patient makes no water; and if the catheter be applied, none will be found in the bladder. The patient feels unwell, restless, anxious, with a slight pain in the loins and bowels, perhaps; but on the whole not ill enough to give any very good account of it. After a little time, nausea comes on, and perhaps vomiting, and soon drowsiness, wanderings of mind, incoherent talk, hiccough, stupefaction, and death. These head symptoms are caused by the shutting up, in the kidneys, the natural outlet of urea, of an excrementitious matter, which acts as a poison to the nervous system. Before death, the perspiration has a strong smell of urine.

Treatment.—The cause of this complaint not being known, the treatment must necessarily be a little uncertain. We cannot go amiss, however, in placing the patient immediately in a warm bath for fifteen or twenty minutes. Then apply over the kidneys either mustard poultices or hot fomentations.

Let the bowels be opened by the compound powder of jalap, or by elaterium (31). Epsom salts or cream of tartar might in some cases be substituted for the above. A stimulating injection is also desirable (246).

Diuretics, as sweet spirits of nitre, digitalis, queen of the meadow and peach-leaves, equal parts, and marshmallow, are of course called for.

Much of the poisonous matter retained may be got out through the skin, by a free use of the compound tincture of Virginia snake-root or tincture of veratrum viride in full doses.

Although the symptoms, in the earlier stages of this complaint, may not attract much attention, or be thought worthy of notice, yet the treatment should be prompt and energetic, as a fatal termination is sometimes reached in the brief space of forty-eight hours.

Retention of Urine.

THIS disorder is often confounded with suppression of the urine, but it is different in every respect. In *suppression*, the urine is not formed by the kidneys; in *retention*, it is formed, and, in some cases, poured into the bladder, but is *retained* on account of some inability to pass it.

Ischuria. — This is one of the forms of retention. In this complaint, the urine has passed from the kidneys to the bladder, but from some cause, generally palsy of the muscles of the bladder, it cannot be passed off. In this case, there is no pain, but the stream of water flows off with slower and slower pace, — the patient having to make tiresome efforts with the abdominal muscles to get the bladder emptied. As the quantity discharged diminishes, the desire to urinate grows more urgent. Pressure just above the pubes gives pain, and the bladder feels under the hand like a large, hard tumor.

Dysuria. — In this form of the complaint, the water is passed to some extent, but with pain and heat along the water-pipe. This is generally caused by some inflammation along the urethra.

Strangury. — In this the water is only passed drop by drop, and with great burning, scalding, and tenesmus in the neck of the bladder. When there is considerable inflammation, the skin becomes hot, the pulse hard and quick, and the tongue covered with a white fur.

Causes. — These several forms of the complaint are caused by palsy of the bladder, gonorrhœa, inflammation in the neck of the bladder or the water-pipe, mechanical injuries of the bladder in child-bearing or otherwise, by tumors pressing upon it, by irritation from gravel or stone within its cavity, by stricture or partial closing up of the urethra, by disease of the prostate gland, by taking spirits of turpentine or cantharides, or by the absorption of this latter article when used as a blister.

Treatment. — It is obviously necessary in this complaint, that treatment, in order to be of any avail, should be prompt; for when the retention is complete, the bladder will burst in from two to five days, and cause the death of the patient.

The treatment must vary according to the cause of the retention.

If it be caused by palsy of the bladder, the common flexible cathe-

ter must be used daily until the muscular fibres recover their lost power. When much irritation is caused by introducing it, it is better not to withdraw it, but to close its external orifice with a small plug, which the patient can remove as often as necessary to let off the urine. To remove the paralysis, the electro-magnetic machine is worth a trial, the current being passed through the bladder. At the same time let the patient take strychnia (85), (86), (83), (95). Cantharides, in the form of tincture, or in connection with strychnia (291), is often used.

If the retention is caused by inflammation of the neck of the bladder, heat should be applied to the perineum, and three or four drops of croton-oil may be rubbed on just above the pubes to bring out an eruption. Warm fomentations will also be serviceable, and warm hip-baths. Cooling diuretics, as infusions of marshmallow, cleavers, pumpkin-seeds, buchu, sweet spirits of nitre, etc., must not be omitted.

Inability to Hold the Urine. — *Enuresis*.

THIS complaint, generally called incontinence of the urine, is quite common among children. In some cases the child has no ability to hold its water at any time; but generally it is only passed off involuntarily at night while in bed. In adult life it is less frequently met with, except among the old.

Causes. — Irritation of the roots of the spinal nerves which go to the bladder, mechanical injuries of the bladder, palsy of the bladder, particularly in old people, debility of the neck of the bladder, a general weakness of the nervous system, worms in the bowels, piles, whites, gravel or stones in the bladder, long prepuce in boys, etc.

Treatment. — As a general rule, the change of constitution which occurs at puberty cures this complaint. But as this does not always happen, it is important that parents do everything in their power to break it up early, lest it become an affliction for life.

Children who suffer from this disorder are apt to drink largely. This habit should be restrained. But little drink should be allowed, whatever the desire for it. Care should be taken that the child make water before going to bed, — also that it be aroused at a late hour for the same purpose, and that the foot of the bed be elevated so as to draw the urine away from the neck of the bladder.

The skin should be washed all over, every day, with cool or cold water, and vigorously rubbed with a coarse towel. This will cause the excess of fluids to pass off through the skin, and lessen the action of the kidneys.

In some instances children urinate in bed through carelessness, being half conscious of what is occurring, but not caring enough to rouse themselves. In such cases, they are often cured by some decided correction, — the impending act of passing water connecting

itself in their mind with the correction, and recalling them instantly to full consciousness. Of course this mode of relief should be resorted to with great judgment and caution.

Ergotin in 1 grain dose given two or three times a day or a mixture containing 15 drops of the fluid extract of ergot or 10 drops of the tincture of belladonna given in water, morning and night are the best remedies. When any disturbances of the eyes are complained of, belladonna must be stopped.

If the disorder be caused by irritation of the spinal nerves, cold water douched upon the back, or croton-oil rubbed along the spine, or a warm stimulating or irritating plaster upon the lower part of the back, will be required. The electro-magnetic machine may do well in some cases.

Urinary Deposits. — Gravel. — Stone.

UNNATURAL deposits in urine are to be regarded simply as evidences of changes which disease is making in the body. As such they are valuable, — more valuable, in many cases, than any or all other symptoms we can study, and most valuable from the ease with which they may be investigated. Yet but very few physicians, comparatively, pay any special attention to them, or make any effort to acquire the small amount of knowledge needed for their detection.

Sources of the Urine. — The urinary secretion has three sources. The largest bulk of it comes from the superabundance of drink taken into the stomach. This is shown from the free flow of pale urine after taking copious drafts of water or other fluids. Such quantities of water as are often drunk, would embarrass the functions of animal life, were it not pumped off by the kidneys.

A second source of supply for the urinary secretion is to be found in the elements of imperfectly digested food, and also some abnormal elements arising from incomplete assimilation. Oxalic acid is a specimen of the latter, being sometimes largely excreted, in dyspepsia, soon after a meal.

The third source of urine is found in those old and worn-out atoms of the system, which can serve no further useful purpose in the animal economy, and which cannot be got rid of by the lungs or skin. It is only, however, one portion of the dead tissue, namely, that which is rich in nitrogen, which goes out through the renal strainer; another portion, which has a preponderance of inflammable elements — carbon, hydrogen, and perhaps sulphur — takes the outward channel through the liver, as bile.

Characteristics of Urine.—Healthy urine has a light amber color, is transparent, and has different degrees of density, its specific gravity varying from 1.003 to 1.030. It has an aromatic, violet-like smell, and a bitter, disagreeable taste, like salts.

That which is passed a little time after drinking largely, is pale, and has a low specific gravity, varying from 1.003 to 1.009, and is called *urina potus*. That passed soon after the digestion of a full meal, is called *urina chyli*, or *urina cibi*; it has a specific gravity from 1.020 to 1.030. That which is secreted *from the blood*, and is passed before eating or drinking in the morning, is called *urina sanguinis*; and has a specific gravity of from 1.015 to 1.025. This is the best specimen of the average density and nature of healthy urine.

Healthy urine contains urea, uric acid, sulphuric acid, phosphoric acid, lime, magnesia, phosphate of soda, etc. It is only when these are discovered in *excess*, that they indicate disease.

Examination of Urine.—Let a piece of blue litmus-paper be first dipped in the urine; if it be acid, the color of the paper will be changed to *red*, or reddish-brown. Should the blue color remain unchanged, then use yellow turmeric or reddened litmus paper; if the urine is alkaline, the turmeric will become brown, and the reddened litmus will be changed to blue. If the color in both cases remains unaltered, the urine is neutral; that is, neither acid nor alkaline.

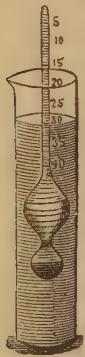


FIG. 115.

This being done, let the specific gravity be taken. This is easily done by the urinometer (Fig. 115). This instrument is known also by the names hydrometer, and gravimeter. It is generally made of glass. When placed in distilled water, it will sink to a certain point; and as all bodies immersed in fluid displace a bulk equal to themselves, it follows that in a fluid denser than water, the instrument will not sink so deep. The space above the large bulb is marked off into degrees corresponding to different densities. When this instrument is immersed in urine, and has come to rest, the number on the graduated scale, which stands at the surface of the liquid, when added to 1.000, will represent the specific gravity of the fluid. If, for example, the surface of the liquid corresponds with 9 on the scale, the specific gravity of the urine will be 1.009; if at 25, it will be 1.025.

By attending to the specific gravity of the urine, the physician may often gain important information respecting his patient, as it may be made to show him how much solid matter is daily carried out of the body through the kidneys. This, at the bed-side, may often give useful hints in regard to treatment.

The following table, constructed by Dr. Golding Bird, shows at a glance the amount of solid matter in 1000 grains of urine of different densities:—

Specific Gravity.	Solids.	Water.	Specific Gravity.	Solids.	Water.	Specific Gravity.	Solids.	Water.	Specific Gravity.	Solids.	Water.
1001	2.33	997.67	1011	25.63	974.37	1021	48.93	951.07	1031	72.23	927.77
1002	4.66	995.34	1012	27.96	972.04	1022	51.26	948.74	1032	74.56	925.44
1003	6.99	993.01	1013	30.29	969.71	1023	53.59	946.41	1033	76.89	923.11
1004	9.32	990.68	1014	32.62	967.38	1024	55.92	944.18	1034	79.22	920.78
1005	11.65	998.35	1015	34.95	965.05	1025	58.25	941.75	1035	81.55	918.45
1006	13.98	986.02	1016	37.23	962.72	1026	60.50	939.42	1036	83.88	916.12
1007	16.31	683.69	1017	39.61	960.39	1027	62.91	937.09	1037	86.21	913.79
1008	18.64	981.36	1018	41.94	958.06	1028	65.24	934.76	1038	88.54	911.46
1009	20.97	979.03	1019	44.27	955.73	1029	67.57	932.43	1039	91.87	909.13
1010	23.30	976.70	1020	46.60	953.40	1030	69.90	930.40	1040	93.20	906.80

The mode of using the above table is this. Having learned the density of the urine passed in twenty-four hours by means of the urinometer (Fig. 115), a glance at the table will show the proportion of solid matter and water in 1000 grains of the urine. Then, by weighing the whole quantity of urine passed in twenty-four hours, the weight of solids drained off by the kidneys may be determined by the simple rule of proportion.

Symptoms of Gravel. — A sudden attack of pain in the region of the kidneys, so acute and severe, frequently, as to cause fainting and even convulsions. The pain runs down to the groin and thigh, causing a numbness on the affected side, and a drawing up of the testicle. The pain is excessive at times, and then remits. Finally it stops suddenly.

Leading from the kidneys to the bladder are two small tubes about the size of a goose-quill, called ureters, — being the appointed channels of the urine. The pain, of which I have spoken, is caused, generally, by the passage of a stone along one of these small tubes. If the stone happen to be a little too large for the tube, or uneven or ragged upon its surface so as to bruise and tear the delicate lining of the ureter, severe pain is the result. The pain is intense when the stone moves along; remits when it stops; and suddenly ceases altogether, when it gets through, and drops into the bladder.

Sometimes there is no pain, the gravel being so fine as to pass through the ureters very easily. It then passes through the urethra also, and is found as a sediment of the urine at the bottom of the vessel.

These urinary deposits are various, and quite unlike each other in kind. They indicate different states of health, and require to be spoken of separately.

Uric-Acid Gravel.

THIS form of deposit passes indifferently under the name of *uric acid gravel*, or *lithic acid gravel*. The person who is in the habit of passing this kind of deposit largely, is said to have the lithic or uric acid diathesis or condition.

The urine of persons in this state lets fall, after it has stood awhile, .

a reddish sediment, like brickdust. This consists chiefly of urate of ammonia (Figs. 116 and 117), tinged with certain coloring matters. This coloring substance may be more or less abundant, and give to the deposit various shades, as dirty-white, yellow, pink, and red. The



FIG. 116.

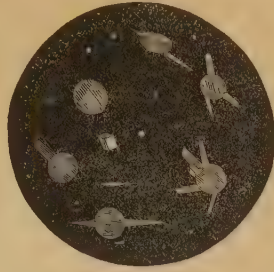


FIG. 117.

pure uric acid sometimes appears as fine sand, or large crystals (Fig. 118). The urine is of a dark copper-color, about like brown sherry, and is more scanty than in health. It is also highly acid, giving to litmus paper a deeper shade of red.



FIG. 118.

Persons who pass this kind of gravel largely are apt to be troubled with inflammatory complaints; with acidity of the stomach and heartburn; and some of them with gout and rheumatism.

Placed under a blowpipe, uric acid is decomposed, and gives out an odor like that of burnt feathers, combined with the oil of bitter almonds. It is dissolved by liquor potassa, from which muriatic and nitric acids precipitate it; and by sulphuric acid, from which it is precipitated by water. Acetic, nitric, and muriatic acids, alcohol, ether, and water, do not dissolve it.

Causes.—Uric acid is the form in which nitrogen and the effete compounds which contain it are got out of the body. It is the result of the decomposition of the tissues of the body. Its gravelly particles are the sands of life daily washed out of us,—reminding us always that we are wasting away. Whatever causes the body to waste rapidly, produces it in excess. We find it, therefore, in the urine of those who suffer from gout, rheumatism, dyspepsia, fevers, debility of the genital organs, straining of the loins, etc., which produce loss of flesh.

Treatment.—The remedies for this uric-acid gravel are the *alkalies*, bicarbonate of potash, bicarbonate of soda and magnesia. The

first named is generally the best. It may be used in the form of the neutralizing extract,—especially if there be costiveness. If the bowels do not need physic, let the potash be taken in the shape of lye made from hard-wood ashes (300). Fluid magnesia is an excellent remedy; so is liquor potassa, taken in twenty or thirty-drop doses. The urine must be watched, and these remedies discontinued when it becomes alkaline. Black coffee drunk freely every day is an excellent remedy.

At the same time the stomach should be supported by some bitter tonic, as the infusion of quassia, gentian, columbo, Peruvian bark, etc.

Iron is, in many cases, not to be overlooked. If the patient be pale and bloodless, some of the preparations of this metal will be needed (61), (73), (74).

Acid must be carefully avoided, both in food and drink.

The diet must be plain, digestible and nourishing, and quite moderate in amount. The *quality* is of less consequence than the *quantity*.

Exercise is of great consequence, and must be regular, and, if possible, in the open air.

The skin must receive daily attention in the shape of an alkaline sponge-bath, with friction. This will throw upon the skin much of the labor done by the kidneys. Poland Spring water used in large quantities is good.

Phosphatic Deposits.

THESE deposits are indicated by a state of the urine just the opposite of that which contains the uric-acid gravel. They are contained in urine which is either alkaline when passed, or becomes so very soon by standing.

As the urine cools, a white sand falls to the bottom, and frequently a film forms upon the surface of the water. Looking at this film in different lights, you may see in it the several colors of the rainbow. Skim off this pellicle, place it upon paper, and let it dry; and you may then see the little shining crystals. This urine quickly grows putrid and offensive. Sometimes it smells strongly of ammonia. The more phosphates it contains, the sooner it becomes alkaline.

These deposits are generally the triple phosphates. Healthy urine contains the phosphate of magnesia in a state of solution. Under some circumstances, the urea of the urine is decomposed in the kidneys, and ammonia is disengaged. This combines with the phosphate of magnesia, and forms the triple salt of the phosphate of ammonia and magnesia, which is not soluble.

Symptoms. — A sallow complexion, a languid, spiritless state of mind, and an exhausted, debilitated condition of body. The urine is pale, rather copious, slightly turbid, has a low specific gravity, and smells unhealthy, having sometimes the faint odor of weak broth. There is generally derangement of the digestive organs, windy stomach and bowels, nausea, constipation, or diarrhœa, stools of various

colors, and sometimes, in diarrhœa, resembling yeast, and an aching pain and weakness in the loins.

Causes. — These deposits are produced by great debility of the constitution, by injuries of the spine, dyspepsia, defective assimilation of food, bad diet, irritation of the neck of the bladder, and organic disease of the kidneys. But they are caused more especially *by whatever wears and exhausts the nervous system*, as heavy cares, depression of spirits, sedentary habits, great mental exertions, masturbation, and venereal excesses.

Treatment. — These deposits being connected with great debility, care must be taken not to make the matter worse by taking active purgatives, by extreme fasting, or by any means which will increase the weakness.

On the contrary, the strength must be supported by all the means that can be commanded. With this view, the citrate of iron (75) may be taken. Arsenic combined with iron (80), to allay irritability, and impart strength at the same time, may be used. The valerianate of iron (93) is excellent for the same purpose.

Connected with a state of urine just the opposite to that which holds the uric-acid deposits, this form of gravel calls for the opposite remedies. Instead of the alkalies, the acids are wanted. The nitric and muriatic acids, with a vegetable tonic (76), may be used. Borax is spoken of in high terms, and is thought by some to have great power in turning alkaline urine acid. The compound balsam of sulphur is highly spoken of, and the compound infusion of trailing arbutus is also mentioned with approbation.

It is all-important to throw off care, and to give the mind a chance to rise up with all the elasticity it has. To bring this about, journeys and amusements are useful. The society of lively, laughing, witty friends will do a great deal to give the spirits a rebound, and the whole health an upward movement. Such persons are a blessing to the world; and he who reckons a few of them among his friends will live the longer for it.

The skin should have the benefit of the daily tonic effect of a sponge-bath, with water at first tepid, and afterwards cool; and exercise, out of doors, should be habitual, and connected, as much as possible, with objects of pleasure.

The drinking of hard water is highly injurious; and if none other can be had, it should be distilled, and then spread out to the atmosphere, in shallow vessels, that it may recover its pleasant taste by reabsorbing air and carbonic acid.

Oxalic Deposits.

OXALATE of lime in the urine is the cause of this kind of gravel. It appears in the form of dumb-bells, and octahedral crystals. (Figs. 119, 120, and 121.)

The urine has a specific gravity of 1.015 to 1.025, and is generally of a dark amber-color, and clear and bright; it is generally acid,

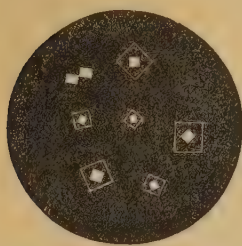


FIG. 119.



FIG. 120.



FIG. 121.

though occasionally alkaline or neutral. Urea is generally found in it, and epithelial cells (Fig. 122). Unlike the uric and phosphatic urines, it is quite free from sediments, except, as often happens, there is a large amount of urea in it, in connection with the oxalate of lime.

When the urate of ammonia is combined with the oxalate of lime, it often happens that the latter has to be dissolved with a little liquor potassa, before the former can be seen with the microscope.

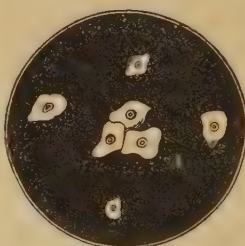


FIG. 122.

Symptoms.—Great depression of spirits, excitable state of the nervous system, painful susceptibility to external impressions, dyspeptic symptoms, and disturbances of the liver, a fear and dread of consumption, emaciation, inability to make exertion, — the smallest exertion causing fatigue; in men, a deficient sexual power, a pain and weight across the loins, and some irritability of the bladder.

Causes.— These deposits are supposed to result, like most other derangements connected with loss of flesh, in too great a degree of oxidation. Vegetables produce oxalic acid by just the opposite process, namely, deoxidation.

Whatever depresses the vital powers, may generate this deposit, as mental depression, overwork of the brain, burdensome cares, idleness of mind or body, masturbation, debaucheries, intemperance, venereal excesses, and injuries of the spine.

This deposit may also be produced by certain articles of diet, which contain the oxalic acid. Among these may be named the rhubarb plant, which in summer is largely used for tarts; and sorrel.

Treatment.— The treatment for these deposits should be very much like that for the phosphatic. The stomach and liver should receive some special attention. A pill of leptandrin, podophyllin, etc. (39), may be used with advantage. The preparation of nitric and hydrochloric acids (76) must generally be taken for some time. In cases of great irritability, the sulphate of zinc (82) does well.

The diet should be plain, digestible, and nourishing,—all articles containing oxalic acid being rejected, as the rhubarb plant, sorrel, tomatoes, onions, etc.

For the rest, follow the directions for the treatment of phosphatic deposits.

Urate of Ammonia Deposits.

THE urine which contains these deposits is generally pale, and of low specific gravity, about 1.012. It becomes opaque on cooling, from the deposition of a nearly white urate of ammonia. Instead of falling down readily, this forms ropy masses in the fluid, and looks like mucus or pus, or something between the two. Its real nature is discovered by applying a little heat, which quickly dissipates it.

Microscopic Character. — Place a drop of this turbid urine between two slips of glass, and examine it closely with a microscope; you will see myriads of minute globules adhering together in linear masses. Now place a drop of the turbid urine in a watch-glass, and gently warm it; as soon as it has become clear, add a drop of hydrochloric acid to it, and when it is cold, examine it with the microscope. The muddiness will be gone, and you will now see lozenges, or thick cohering prisms of uric acid (Fig. 123). The explanation of this is, that the hydrochloric acid combines with the ammonia, forming muriate of ammonia in solution, and liberating the uric-acid crystals.



FIG. 123.

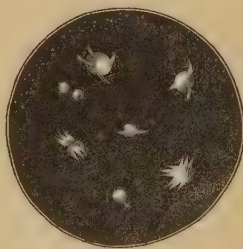


FIG. 124.

Urate of soda (Fig. 124) is sometimes found in urine, which has similar chemical reactions with urate of ammonia.

Causes. — These deposits are generally produced by some over-eating, or derangement of the skin.

The treatment is the same as that for uric-acid gravel.

Hippuric Acid Deposits.

THESE deposits appear in the healthy urine of the cow and the horse; and also in that of human beings, but in such small quantities as to be scarcely appreciable.

They sometimes, however, appear in unhealthy proportions; but they never show themselves as a sediment, until after the addition

of a stronger acid. The urine containing them is generally slightly acid or neutral, — sometimes alkaline, — having a low specific gravity, from 1.006 to 1.008. The triple phosphates are often found in it.



FIG. 125.

To detect these deposits, fill a large watch-glass with urine, and evaporate it over a lamp to a few drops. Then add to it about half its bulk of hydrochloric acid, and set it aside. The addition of the acid produces a bright pink color, and an odor like new hay. After a few hours, if the hippuric acid be present, its peculiar crystals will be seen. (Fig. 125.)

Cause. — In man, this deposit is supposed to depend on the absence of food having a good share of nitrogen. The urine of vegetable-eaters contains it in largest quantities.

Treatment. — The only treatment required is a diet composed in good proportion of animal food, a proper attention to the skin by bathing, etc., and when debility exists, tonic medicines, as iron and bitters, with out-door exercise enough to keep the muscles in working order.

Cystine Deposits.

THESE do not occur in healthy urine, and rarely as an element in diseased action. They contain twenty-six per cent of sulphur.

Urine which contains cystine is of a pale yellow color, and has a low specific gravity. It frequently has an oily appearance, and its smell is peculiar, resembling that of sweet brier. Sometimes its odor is fetid, like putrid cabbage. On being kept for a short time, it has its surface covered with a pellicle which looks oily, and consists of a mixture of crystals of cystine and the phosphate of ammonia and magnesia.

The cystine deposit appears to be diffused through the urine, which is always turbid when boiled. It is a white or fawn-colored powder, and falls to the bottom as a sediment. It undergoes no change by warming the urine, and this distinguishes it from white urate of ammonia. It is not soluble in diluted hydrochloric or strong acetic acid, which distinguishes it again from the earthy phosphates.

To test this deposit, add liquor ammonia to a portion of it, and shake them. If the deposit be cystine, it will dissolve readily. Allow a few drops of the solution to evaporate on a slip of glass, and the six-sided tablets of cystine will remain, which may be examined under the microscope. (Fig. 126.)

It is to be remembered that occasionally the chloride of sodium or common salt crystallizes in octahedral forms (Fig. 127), which, in some positions, may look very much like cystine. The ready solubility of the chloride in water, and the absence of all color when they are examined by polarized light, will prevent mistaking these crystals

for cystine. If urine containing common salt be quickly evaporated on a slip of glass, and be then examined, instead of the octahedrons, we find crosslets and daggers. (Fig. 128.)

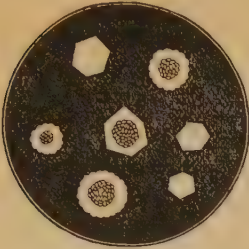


FIG. 126.

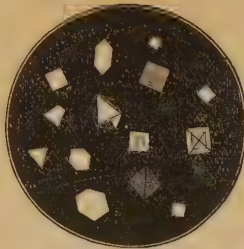


FIG. 127.



FIG. 128.

Causes. — An excess of sulphur in the tissues, a scrofulous constitution, and hereditary predisposition, with defective oxidation, and torpidity of the liver. It is often found in the urine of girls who have the green sickness.

Treatment. — The great object is to improve the general health, which is to be done by attending to the skin, and the administration of iron and bitters, and also alteratives. The syrup of iodide of iron is a valuable remedy. Podophyllin and leptandrin (34) are wanted to regulate the liver. The nitro-muriatic acid (76) should be tried.

The daily sponge-bath, and daily exercise, as in most chronic complaints, must on no account be neglected.

Stone. — Calculus.

It often happens that the proper treatment for removing urinary deposits is not adopted in season. In such cases, gravelly particles, finding a lodgment for a time, in the kidneys or bladder, are apt to draw other particles to themselves, which become fastened to them, and form a layer quite around them. Over this, other layers form in succession, until a stone is produced so large that it cannot pass off. These grow to various sizes, — being sometimes so large as to fill the bladder.

Uric-Acid Calculus. — The most common of these formations is the uric-acid calculus. It is generally smooth or slightly tuberculated on the surface, and varies in color from a pale yellowish-fawn to a reddish-brown. When sawn through the centre, its layers will be found tolerably regular, but of different thickness. (Fig. 129.)

To test it, place a small fragment upon platinum foil under the blow-pipe. If uric acid, it blackens, and gives out an odor like burnt feathers mixed with the oil of bitter almonds.

Mixed Calculus. — These calculi are frequently composed of two or more different kinds of matter arranged in irregular layers. Fig. 130 is a mixed calculus, — the dark layers being oxalate of lime, the light ones uric acid.

In testing such, fragments of each ingredient should be separately examined.

Urate of Ammonia Calculus. — We occasionally meet with a calculus composed of the urate of ammonia. These calculi, when found, are generally small in size, smooth or slightly tuberculated upon the surface (Fig. 131), and of a pale slate or clay color. When heated before the blowpipe, it gradually disappears.

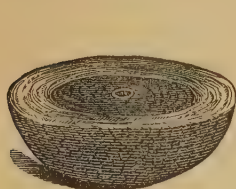


FIG. 129.

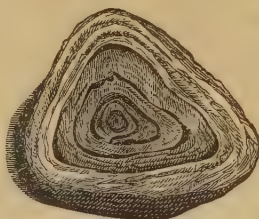


FIG. 130.

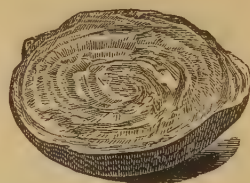


FIG. 131.

Phosphate of Lime Calculus. — This has a smooth polished surface, and quite regular layers, which separate easily when the calculus is cut asunder. It has a pale fawn or stone color. (Fig. 132.)

It chars before the blowpipe, and gradually becomes white as the carbon burns away. Diluted nitric or hydrochloric acid dissolves it without effervescence.

Oxalate of Lime Calculus. — This is frequently met with uncombined with others, but more generally its nucleus is uric acid or urate of lime. It commonly has a brown, dark-olive, or dirty-purple color. Its surface is irregular and somewhat rough. It looks like the fruit of the mulberry, and is known as the *mulberry calculus*. (Fig. 133.)

It dissolves, without effervescence, in diluted nitric or hydrochloric acid. When thus dissolved, the addition of a little ammonia will cause it to fall to the bottom as a white precipitate.

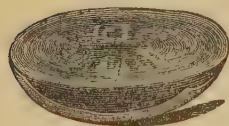


FIG. 132.

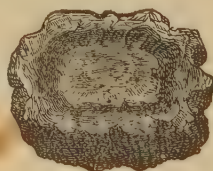


FIG. 133.

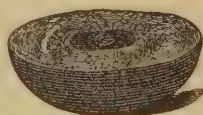


FIG. 134.

Fusible Calculus. — This is a mixture of phosphate of lime and the phosphate of ammonia and magnesia. It is the most common of all the calculi, except the uric acid. It has an oval, irregular form (Fig. 134), and is white, soft, and friable, like chalk. Sometimes it is hard.

It may be known by the readiness with which it melts down before the blowpipe, without being consumed.

Causes. — The causes of the different kinds of gravel have been already explained. Generally stones of the bladder are formed in the

kidney, and descending through the ureters into the bladder, are prevented from passing out through the water-pipe by an enlarged prostate gland. Remaining in the bladder, they soon get encrusted over by other matters in the urine, and grow by accretion to be stones.

Symptoms. — When a stone in the bladder reaches a certain size, especially if it is rough, it always produces suffering. A dull, annoying pain is felt at the end of the penis. The desire to make water is frequent, and there is a sense of weight in the perineum. Sometimes the stream of urine is suddenly stopped by the stone falling on the orifice of the urethra. As the bladder becomes nearly emptied, it embraces the stone, and the pain is increased. Jolting in a carriage causes great pain. Mucus passes off with the urine, and sometimes blood. After a time, the appetite fails, hectic sets in, albumen appears in the urine, and the patient sinks under inflammation of the bladder.

These symptoms being found in diseases of the kidneys and bladder, no one is authorized to pronounce upon the existence of stone, until the stone has been touched by a metallic sound introduced into the bladder.

Treatment. — The only effectual treatment is a choice between three operations, — *lithotrity*, *lithotomy*, *litholopaxy*.

The first consists in introducing an instrument, a kind of forceps, into the bladder, through the urethra, taking hold of the stone, and crushing it. The preparatory treatment consists in correcting the unhealthy state of the urine, and the frequent introduction of bougies or sounds to enlarge the water-pipe for the easy entrance of the crushing forceps. The after treatment consists in diluent drinks to increase the urine, injections of warm water to wash out the fragments, with hip-baths, soothing injections, and leeches or cupping upon the perineum.

Lithotomy consists in making an incision into the bladder through the perineum, and taking out the stone or stones whole.

Litholopaxy consists in crushing the stone *in situ* by means of the lithotrite and syphoning out the debris.

Dropsy of the Belly. — Ascites.

THIS is a collection of water in the cavity of the belly; sometimes the fluid is outside of the peritoneum, and next to the muscles.

Symptoms. — An enlargement of the belly, with a sense of distention and weight, — particularly on the side on which the patient lies. When the collection of water is large, the breathing becomes short and difficult, and the swelling is uniform over the whole abdomen.

In some instances the fluctuation of the water may be distinctly heard when the patient moves about, — just as we may hear the water in a half-filled barrel when it is rolled over. This sound of the fluid, when heard, distinguishes the complaint from pregnancy,

and from the drum-head state of the bowels. This fluctuation may sometimes be produced by pressing upon one side of the belly while the patient is standing or sitting, and striking the other side with the ends of the fingers of the other hand.

In some cases, there is loss of appetite, dry skin, costiveness, scanty urine, oppression of the chest, cough, colic pains, and variable pulse.

Causes.—A frequent cause of this complaint is chronic inflammation of the serous membrane which lines the abdomen, — I mean the peritoneum. It may also be produced by scarlet fever, fever and ague, disease of the heart, particularly dilation of the right cavities, and diseases of the liver, particularly the shrivelled, hobnail condition of the liver, — in short, whatever causes a pressure upon the portal veins, and obstructs the venous blood returning from the intestines.

Treatment.—The remedies for this disease are mainly diuretics and purgatives. The bowels may sometimes be reduced in a few days from an enormous size, by medicines which excite the action of the kidneys. Digitalis combined with acetate of potash, etc. (130), forms an excellent preparation. The patient should have as a constant drink, a strong infusion made from two parts of hair-cap moss, and one each of juniper berries and dwarf-elder bark; also an infusion of queen of the meadow.

The purgatives used in this complaint are those which produce watery stools. One of the best of these is elaterium. It will sometimes carry off the water with great rapidity; combined with some active cathartics (31), it will have all its good effects without the griping it is apt to occasion alone.

Cream of tartar, taken in large doses, every day, will sometimes do well. Epsom salts produces watery stools, and is a good remedy.

For promoting absorption of the fluid, the iodide of potassium, taken in from three to ten-grain doses, three times a day, is a valuable medicine in many cases. The compound infusion of parsley is said to be still better.

The skin must receive careful attention. The alkaline sponge bath, with friction, will increase the transpiration of fluid through that organ. Exercise does much to keep up an active circulation, and to lessen dropsical effusions.

The strictest temperance, both in eating and drinking, must be observed. A light and nourishing diet, with water, tea, and the diuretics named above for drinks; beyond these the patient must not go.

A kneading and shampooing of the bowels once a day has an excellent effect; it gives activity to the circulation in obstructed veins. A bandage tied close around the bowels, and tightened as the water diminishes, has an effect upon the sluggish vessels similar to that of the laced stocking in varicose veins of the legs. It lessens the liability of a return of the complaint.

Dropsy of the Cells. — General Dropsy. — *Anasarca*.

JUST under the skin is a membrane composed chiefly of cells, called the cellular membrane. When a considerable part or the whole of these cells are filled with a watery fluid, we call the complaint *anasarca*, or *cell-dropsy*. If, besides this, there is a collection of water in the large cavities, we give it the name of *general dropsy*.

Symptoms. — The disease generally begins with a swelling around the ankle and leg, which is more visible at night after standing and walking, and is less perceptible in the morning in consequence of the horizontal position of the night. To the touch of another person, dropsical feet and legs feel a little colder than natural; and when hard pressed with the finger, a pit will be sunk in the flesh, which remains some time before it fills up. As the disease advances, the skin of the legs becomes smooth, shining, and sometimes even cracks open to let out the water. The limbs, and indeed the whole person, become stiff, heavy, and clumsy.

As the disease advances, and ascends to the belly and chest, there is shortness of breath, a sense of suffocation on moving or lying down, a tightness and distress across the epigastrium, thirst, dryness of skin, wakefulness, loss of appetite, scanty and deep-colored urine, and a slow fever.

Cause. — General dropsy is caused by whatever weakens the general system, and by such circumstances as obstruct the circulation in the veins. The most frequent causes, therefore, are certain diseases of the heart and kidneys.

Explanation. — Modern physiology has demonstrated that the veins do a certain part of the work of *absorption*. The serous membranes which line the larger cavities of the body exhale watery fluid enough, and no more than enough, to keep them moist, and cause the organs within to play smoothly upon their surface. If the fluid were not taken away as fast as it is poured out, the cavity, being a shut sac, would become full, and we should have dropsy. It is the office of the veins to absorb this fluid and convey it away in the general current of the blood.

This is the method of their doing it: The walls of the veins are so constructed as to *permit watery fluids to pass through them, either in or out*. When they are comparatively empty, or only moderately full, fluids on the outside pass *in*, and mingle with the contents. This is called *endosmosis*. When they are very full, the watery portion of the blood will filter through, and pass *out*. This is called *exosmosis*.

Now, if the reader will think a little, he will easily see that if the veins are barely full enough not to allow any fluid to *pass in*, the natural exhalations of the shut sacs would bring on dropsy; but if

the veins are so full as to cause water to *flow out*, then the dropsical accumulation will be still more rapid.

Diuretin in 20-grain doses dissolved in water and taken five or six times a day may prove serviceable in both this disease and the one on the preceding page.

Uremia.

Uremia intoxication is the result of the failure of the kidneys to perform their normal function of eliminating some one or all of the poisonous elements of the urine.



Diagram Showing the Circulation of Blood through Kidneys. The Arrows show the Direction of Circulation and Waste Matter that is extracted from the Kidneys as it goes through them. (aa) Small Tuft of Arteries and Vessels of the Poison-removing Centre. (e) Vessels conveying outward the Waste-Matter. (cccc) Minute Blood Vessels around the Series of Little Tubes found in each of the Twelve Pyramids which form the Kidneys. (vvv) Veins which Collect Blood from Tubules. (ggg) Three Small Tufts of Vessels. (ttt) Tubes Leading from Small Tufts of Vessels.

The toxemia may develop suddenly, by a convulsive seizure followed by coma, or come on gradually. Usually the attack is preceded by a decrease in the urinary secretion; although in rare instances, the normal urinary flow has been largely exceeded.

The onset appears usually with headache, dimness of vision, dilated, sluggish pupils, drowsiness, vertigo, deafness, dusky countenance, nausea, vomiting; the mind is dull, deepening into stupor, to be followed by coma, or convulsions precede the coma, which terminates in death, unless the poison causing the attack is rapidly eliminated.

Treatment.—The treatment of this dangerous manifestation of renal disease is often vain though wonderful recoveries have occurred under judicious management. Whether the symptoms of the disease show themselves gradually or suddenly the first endeavor is to rid the system of the poison that is threatening life, and aid in its elimination through the bowels, skin and kidneys; second, the vital organs must be supported until elimination has been in part at least accomplished; third, any convulsive seizures must be warded off or arrested.

Elimination of the poison may be internal or external; externally, the hot pack being resorted to to increase the activity of the skin; internally, the induction of watery purging at once aids elimination through the bowel and relieves dropsy if present. Elaterin $\frac{1}{16}$ gr. may be given, dissolved in a few drops of alcohol or whiskey.

In every case of uremia the blood pressure should be taken and an estimate made of the strength of the heart. If the blood pressure is much above normal, say 150 or 160 millimeters of mercury, stimulants are not needed, as a rule, but nitroglycerine $\frac{1}{50}$ gr. or sodium nitrite 1 to 2 gr. may be given. Aromatic spirits of ammonia and Hoffman's Anodyne are valuable if the heart is weak, and are to be followed by strychnin and digitalis if necessary.

For the support of the heart and respiratory function, strychnin $\frac{1}{50}$ gr. may be given, followed by digitalis, 30 minims.

Convulsions, if present or threatened, are to be combated by the use, after the bowels have been washed out, of an enema of 20 gr. of chloral and 60 gr. of bromide of sodium in 3 ounces of starch-water, and the hot pack will also be of value, not only to produce sweating, but for its sedative influence on the nervous system. Should the convulsive tendencies be marked, amyl nitrite inhalations may be employed until the chloral and bromide can be absorbed.

An attack of acute uremia is always a very grave condition. The prognosis depends upon the amount of retained poison, the length of time it has been retained, and the conditions of the organs of elimination.

VENEREAL OR SEXUAL DISEASES.

OF all the diseases to which flesh is heir, none bring so much misery, moral and physical, as those called sexual or venereal. To the physician, they are the source of the greatest anxiety and perplexity. They bring him into possession of the most delicate secrets, — secrets which involve the peace of families and neighborhoods, — secrets which his honor as a man, and his truth as a physician, compel him to lock fast in his own breast, and hold sacredly apart even from his nearest companions, — secrets which, if revealed would fill domestic circles with unutterable bitterness and heartburnings, and whole neighborhoods with scandal and immorality. These secrets are often a burden to him. They are in his breast like undigested food in the stomach, — disturbing the whole nature.

The patient, if a man of sensibility, suffers even more, of course, than his physician. In many cases, he *is* a man of virtuous intentions, and perhaps of religious habits, who has fallen in a moment of temptation; and he fears that the effect of his sin will spread itself through his whole system, and extend to the end of life; or, still worse, that having poisoned the fountain of his life, it will go down as a heritage of misery to his offspring; or, what he would deprecate as almost equally calamitous, that the partner of his bosom may become the innocent partaker of his disease.

In this state of apprehension, he turns to his physician, not merely to keep his secret, but to cure his disease. How great a pity that, in such circumstances, he does not always fly immediately to an honorable physician, instead of seeking the advice, as many do, of those miserable quacks, who lure him to their dens only to get his money, having no intention or ability to cure his complaint.

These diseases are divided into two great branches, characterized, in part, by different symptoms, and generally held to be entirely different complaints. The first to come under consideration is

Pox. — *Syphilis*.

THIS disease had a very early origin. It was known among the Jews, as we learn very clearly from the fifteenth chapter of Leviticus. Dr. Adam Clarke's Commentary upon this chapter, at least, makes it apparent. David, the king of Israel, has unconsciously left on record, in the thirty-eighth Psalm, a most graphic description of Tertiary

Syphilis, experienced in his own person. Dr. Clarke says: "It is most likely the Psalm was written in reference to some severe affliction that David had, after his illicit commerce with Bathsheba; but of what nature, we are left to conjecture from the third, fifth, and seventh verses." The Psalm is dated not quite a year after the act alluded to, — about the right time for the terrible symptoms David describes to make their appearance.

The term syphilis is from a Greek word signifying filthy. There is one unvarying sign of this disease, — the existence of an ulcer or ulcers, usually upon the genital organs. The French call this ulcer a chancre. The common name is simply venereal sore, or ulcer. A pimple first appears; on the summit of this a pustule forms; then the rupture of the top of this brings to view the ulcer or sore. This ulcer is shallow, more or less circular or oval in form, bounded by a perpendicular and slightly jagged border, and furnished with a smooth, yellow base, moistened by an unhealthy secretion. The skin around the sore is a little thickened and inflamed. This is a simple venereal ulcer. It generally lasts about five weeks, and then heals.

But it is not always thus simple. It may be an inflammatory chancre, attended by excessive inflammation. It may be what is called a *sloughing chancre*, characterized by the perishing and falling off of large parts of flesh. It may be *gangrenous*, or marked by a tendency to mortification. It may be *phagedenic*, or *eating*, — being distinguished by a rapid loss of substance, or eating away of flesh. Or, finally, it may be *indurated*, — being noted for the peculiar hardness of the base, and of the flesh immediately around it.

A venereal sore is the result of impure connection with a person having the syphilitic disease. The poisonous secretion of a sore, applied to the skin of a healthy person, produces *inoculation*, and a new sore upon the previously healthy person is the result. This chancre appears in a few days after coition, — a certain time being required for it to produce its effect, as in the application of vaccine matter to the arm.

Bubo. — The next symptom in the order of occurrence, which frequently follows the ulcer, is the bubo. It is named from a Greek word which means groin, from its usually appearing in that part. It is a painful swelling of the inguinal gland in the groin, and is caused by the absorption of virus or poisonous matter from the chancre. This gland is one of the lymphatics, a class of vessels as numerous, all over the system, as the veins and arteries. They are likewise called absorbents. Those that originate from the private parts absorb the poison from a venereal sore, and convey it to the glands in the groin, which being poisoned by it, inflame and swell.

The bubo generally appears in from one to two weeks from the appearance of the ulcer. It is usually upon the same side which the chancre occupies upon the penis. When the bubo advances to supuration, and becomes an open sore, it is then a glandular chancre.

Vegetations. — These are peculiar growths appearing upon different parts of the skin, which resemble certain vegetables. They are found most frequently, in the male, on the head of the penis, and on the membrane lining the foreskin. In the female, they are found at the entrance to the vagina, and not infrequently in the vagina itself. They sometimes appear on the neck of the uterus.

Primary Disease. — Thus far, the diseases noticed are what are called *primary*. If properly treated, and cured in season, the constitution is not infected, and no subsequent troubles appear. But a result so fortunate as this is not common. Generally, the treatment is either too long delayed, or is too brief and superficial. The poison is, in consequence, absorbed into the circulation; the whole constitution becomes infected; the fluids and solids are so acted on and altered, in fact, that a *special constitution is created*. For this reason the affections of the skin, the mucous membranes, the bones, etc., which follow, are called

Constitutional. — These constitutional diseases never appear immediately, as the result of an impure connection, but only *after* those affections already noticed. The primary diseases are local; the constitutional affections are general.

The first thing which strikes the eye in these constitutional complaints is the *color* and *appearance* they give the skin. It has a *reddish, coppery* tinge, and a peculiarly *dirty* appearance.

The order in which the several parts are affected, are, first, the skin and mucous membranes; second, the hard substance surrounding the bones, called *periosteum*, the tendons, and the bones themselves. Those affections which appear upon the skin and mucous membrane are usually called *secondary*, because they are the *second* to appear; while those affecting the bones, etc., are denominated *tertiary*, because, in the order of their appearance, they are in the *third* class.

Eruptions of the Skin, and Ulcers. — Of the constitutional eruptions, there is a great variety,—so great that I cannot, in small space, give a minute description of them. The breast and arms are not infrequently the first to be affected. Attending these eruptions there is little uneasiness, and no pain; though there is sometimes a slight itching. The first breaking out is usually of a *copper color*, somewhat paler than it subsequently is. The eruption is often in the form of blotches, elevated only a very little above the skin. They are composed of small pustules, with a little fluid in them, which soon dries away, and the whole may be rubbed off like bran. This may leave the skin looking tolerably sound, and inspire the belief that no further mischief is to be experienced. No hope can be more delusive. *Parts afflicted with this complaint show no tendency to heal.* The first crop of pimples is soon followed by a second, which produces a thicker crust, and yields a larger amount of bran. This rubbed off, small ulcers appear underneath.



Vesicular Uruptions.—There is another syphilitic affection of the skin, which appears in the shape of vesicles, like small-pox. These dry and leave a scab.

Scaly Eruptions.—There is still another affection, which is in the form of scales, and one scale will be piled upon another. It begins with an eruption of copper-colored blotches, which become covered with scales; these are succeeded by scabs, and when these fall off, shallow ulcers are left with copper-colored edges. (Fig. 135.) This is a stubborn form.

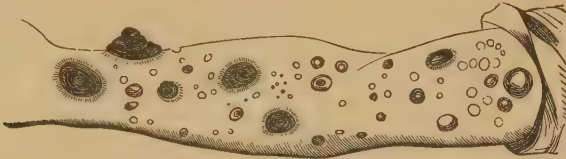


FIG. 135.

Tubercular Eruptions.—In another variety of the disease, broad, red, copper-colored tubercles, or hard elevations appear, most commonly about the sides of the nose, or on the cheeks. Gradually they suppurate, and are succeeded by deep ulcers, terminating in scars. This is an unfavorable form of the disease, and usually appears some considerable time after the primary symptoms, in persons whose constitution has been shattered. PLATE V.

This rather belongs to the tertiary form of the disease; and in addition to the above, patches of unhealthy inflammation are apt to form on the tongue, and after a time break, disclosing ragged, orange-colored ulcers. PLATE VI. Fig. 2.

Many other forms of eruption exist; but in a popular work like this, it would be useless to make the nice distinctions which their description would require.

Some of the worst forms of the secondary affections are found upon the mucous membrane of the mouth and throat. These correspond, in number and size, with the affections of the skin. They affect the lips, the internal sides of the cheeks, the tongue, the tonsils, the pharynx, the soft palate, the nasal cavities, etc. They are terribly destructive in their effects, forming gaping ulcers, and eating deeply into the parts. They often make shocking work in the whole mouth and throat; and, when attended with considerable inflammation, make it almost impossible to swallow anything, or even to open the mouth. I have often seen breaches through the palatine arch (PLATE VI, Fig. 1), and even the whole arch destroyed (PLATE VI, Fig. 2). Persons have often died from starvation,—not being able to swallow. The ulcers sometimes take hold of the tonsils, and “dig them out as if it were done with a punch.”

These ulcerations affect the mucous membranes of the genital organs. In the female, they often affect the vagina and the neck of the womb, and thus may exist for a long time, as the cause

of whites, without being suspected as such. They affect also the mucous lining of the fundament and the large bowel. They sometimes exist in the ear, and more often in the eye. This latter affection passes under the name of syphilitic iritis. In PLATE V. the artist has well represented this form of constitutional disease in the eye.

The disorder having, by frightful ulcers, run riot upon the delicate structures of the skin and mucous membranes, advances boldly onwards, attacking the muscles, the tendons, the hard covering of the bones and the solid bones themselves. No part of the human frame—not even the skeleton—can escape this devouring complaint. The bones of the nose and face are generally the first to be attacked. These perish slowly,—falling away piece by piece,—the nose, in the mean time, sinking down nearer to a level with the cheeks. From these parts the disease may spread to the bones of the whole system.

These affections of the bones are attended by pains of almost every kind and degree. These pains are sometimes fixed in one place; at other times wandering, the whole skeleton being painful. In these latter cases, they seem to the sufferer to reach the very marrow. Sometimes when the pain is fixed in one place, the feeling is such as might be supposed to be experienced if the bone were being *bored*. These pains are most terrible during the night.

Upon those parts where the skin is near the bone, as the forehead, or shin, syphilitic nodes or tumors often appear, which are hard, like cancerous tumors. Besides the above, there are the loss of the hair (alopecia), blindness, deafness, and various other mischiefs, resulting from syphilis, which need not be described.

Is the Constitutional Disease Communicable ? — Many believe, — even among those who are eminent in the profession — that the constitutional forms of the disease are not communicable. A few years ago, indeed, this latter opinion was *generally* received. It is now quite extensively doubted, or rather disbelieved. Facts are constantly occurring under the eye of unprejudiced physicians, which make it very evident that the constitutional disease may be communicated from one person to another.

The Disease Hereditary. — It is no small amount of suffering, bodily and mental, which the individuals endure who contract this disease. But the inflictions visited upon them, severe as they are, are small compared with the aggregate of ills entailed by it upon the long line of their posterity. Whether it be the man or the woman whom the syphilitic virus has inoculated, if it be allowed to be absorbed, so as to affect the constitution, it will be very likely to be sent down to the children, and children's children. The divine law which links the sins of the father with the sufferings of even the third and fourth generation, is nowhere more painfully illustrated

than in the scourging descent, through many generations, of this terrible disease. It may be passed down to posterity by either of the parents; but if both be diseased, the transmission will be more certain. If the mother be infected, she will infect the child while carrying it. If the father's constitution be poisoned, the child will receive the infection from him, through the semen, and will be likely, while in the womb, to infect the mother. I recollect but one author of note (Ramsbotham) who has mentioned this mode of infection. I have myself seen two cases of it.

This constitutional disease, whether it exist in the mother, or be communicated to the child, and thence to her, by an infected father, is a frequent cause of abortion. Throughout nature, blight is the result of a diseased parentage. Mature fruit is seldom obtained from infected seed.

Is the Constitutional Disease Curable?—No question connected with the complaint possesses a greater interest than this. None is pressed more earnestly upon the physician. In a certain sense the disease is curable. Its outward manifestation may be wholly repressed. The health of the person suffering from it may be restored, and become, in an important sense, good. *But this cure is never brought about by nature; it may be, and is often effected by medicine.* I have never failed to effect such a cure in any case which has come under my treatment. Such results may properly, in general terms, be called cured.

Yet there is a sense in which a cure never occurs. It is a well attested fact, that a system once thoroughly pervaded by the poison is never completely purged of it. It may be shorn of all its active malignancies; but it has too intimately permeated the tissues and solid bones to be wholly expelled. Pursue it as we will with the remedial forces of our art, it still takes refuge in the most subtle processes of animal life, — still infects the currents of being, and finds expression in the scrofula, in the lupus, and in the scaly affections of other generations. Dr. Erasmus Wilson, the great authority in skin diseases, says: "I feel convinced that a considerable proportion of those diseases which pass under the name of scrofula are the produce of the syphilitic poison,— are, in fact, not scrofulous, but syphilitic." Astruc thought the same, and suggested, what is doubtless true, that the transmission of syphilis must occur through several generations before it becomes scrofula. Bierchn, Camper, Stoll, Portal, Hufeland, and Alibert, have all advocated the same opinion.

This is doubtless right, though there are many authorities on the other side. He must be a poor observer who cannot discover a probable filial relationship of scrofula to syphilis.

A variety of facts, admitted by the whole profession, go far towards demonstrating this relationship. Scrofula is always hereditary. It is a disease of the parent, imparted to the offspring. But there is scarcely any disease so certainly sent down to posterity as syphilis.

Scrofula is *like* syphilis in many of its characteristics. It is like it in its power of propagating itself from parent to child. It is like it in affecting nearly *all* the children of diseased parents. It is like it in the variety of the structures it attacks, — affecting the skin, the mucous membranes, the bones, etc. Like syphilis it produces hard tumors, ulcers of the skin, abscesses, and decaying of the bones. And finally, the great remedy for tertiary syphilis, iodide of potassium, is likewise the great remedy for scrofula; and, indeed, almost every remedy which acts favorably upon one, is found useful for the other. This could hardly occur were not the diseases identical in nature.

We can scarcely be surprised that a disease so widely diffused as scrofula should be the product of syphilis, when we reflect how frightfully prevalent were the causes of this latter affection during the earlier and the middle ages of the world.

To pass over the records of earlier times, with merely mentioning Abraham, and Lot, and Jacob, and Reuben, and Samson, and David, and Solomon, and numerous females, of whom some singular things are written in the older scriptures, and omitting all mention of the incredible and almost universal debauchery and prostitution of Greece, and Rome, and Persia, and Media, and Egypt, I may say that *Europe, in the middle ages, was well-nigh converted into a vast brothel.*

Foremost in the race of profligacy were those in authority, kings, and emperors. The licentiousness of Childeric knew no bounds. He carried off and violated the wives and daughters of his vassals, without regard to any right, human or divine. His successors were generally a race of lecherous men, who spread debauchery on every hand. The French monarchs, from Pepin and Charlemagne, were a race of debauchees. Their courts were national brothels, in which the finest women in the land were trained in the arts of seduction and lust. Francis I, in 1515, endeavored to invest prostitution with elegance and chivalry, and even to ennoble it, by abandoning the public women of the palace to his subaltern officers, and substituting for them ladies of noble blood. In this movement, the nobles and the officers gave the king their support.

“They are all gone aside; they are altogether become filthy; there is none that doeth good, no, not one.”

Brantome justifies Francis in his selection of girls of noble blood, on the ground that “they could not communicate the venereal disease to the noblemen of the courts, like the common prostitutes.” But the king, who was previously diseased, infected them; and these noble women, so called, passing from the arms of the prince to those of the courtiers, presented to them the fatal infection received from the king.

The way in which Francis himself was infected illustrates, in a most shocking manner, the morals of the times. His illicit loves with

the Belle Ferronnière were not concealed from her husband, who, though obliged outwardly to regard the dalliance of his wife with the monarch as an honor, was inwardly indignant, and determined to become infected himself, and thus disease his wife, and revenge himself upon the king. This plan was suggested to him by a noble who had another motive, namely, that of punishing Francis for some personal spite. "How," said the husband, when the suggestion was made, "shall I give this disease to my wife, when we are both sound?" "Go visit an infected girl," said the noble, "and to render the matter certain, as I am infected, I will see your unfaithful wife." The result was such as the husband desired; and in 1547, Francis I, the gay and chivalric monarch, perished of the most foul and loathsome of all diseases.

Debauchery did not die with him. It was cherished by his successor, Charles IX, and his mother, Catherine de Medicis, and his grandson, Henry III. The reigns of Henry IV, Louis XIII, Louis XIV, the Regency, and of Louis XV, were stained by the same licentiousness and disregard of public decency, until the whirlwind of the revolution came to purify the moral atmosphere.

The reader will now, I think, be in no mood to wonder that the men and women, and many of royal progeny, whether the dishonored occupants of thrones, or the more private recipients of the public bounty, are a scrofulous and degenerating race. Nor need it be much wondered at, that so large a portion of men and women everywhere have more or less scrofula in their frames. Happy are those who can find no trace of this complaint in their constitution! They should rise up and call their virtuous progenitors blessed. They should especially thank God that they have sprung from the loins of a race more noble and kingly in the eyes of Heaven than all the royal lines of the world.

Treatment.—With the well drawn picture of the results of this terrible disease before the reader, he can appreciate the importance attached to proper treatment. If there should be any doubt in the matter whether he has the disease or not, he should at once obtain the opinion of his medical advisor. For instance, the sore on his penis known as the *chancre* may not be syphilitic but be of the so-called soft chancre or chancroid type due to connection with unclean partners, but not due to constitutional infection. They are in reality ulcers but in some cases are markedly similar to syphilitic ones. But their treatment would be distinctively local and entirely different from the treatment of true chancre.

Personally I think time is gained rather than wasted in waiting for an exact diagnosis to be made, and if the train of symptoms beginning with the chancre which will appear from two to six weeks after infection and followed by the ulcerated throat, copper colored rash, sore and enlarged glands in groin, hair falling out and gastric

disturbances often accompanied by fever, show that we have a case of syphilis to attend to, then the way is clear. It was formerly the universal treatment to cauterize the sore at once. The writer has seen so many unsyphilitic sores cauterized unnecessarily, and on the other hand has seen many cases of true syphilis that had been cauterized, and that the only treatment given which is almost malpractice, that he earnestly advises moderation in this matter and desires that the too often assured security promised be at least accepted with reservation. The reason why cauterization is not successful in many cases is because the virus or poison has entered the system before the pimple or sore demonstrates its presence. This will appeal to your reason if you realize that sometimes six weeks elapse after impure connection before the chancre appears.

As in some cases, in my opinion a great minority, thorough cauterization minimizes the trouble and *perhaps* prevents constitutional troubles, its application is described. The general belief is that poison remains in the sore for a time before it is absorbed into the constitution. It is of the utmost importance that it be destroyed before the absorption takes place.

The caustics used are nitrate of silver (stick nitrate), nitric acid, chloride of zinc, potassa with lime, caustic potassa, and the painless caustic.

The nitrate of silver is much used, but the best surgeons now regard it as useless. It does not prevent the absorption of the poison. The caustic potassa, the potassa with lime, and the painless caustic, are the sure remedies,—that is, if applied in season. But they must be employed with caution. It will not do to trust them in bungling hands. A little vinegar and water must be immediately used to neutralize the caustic when it has accomplished what we desire. After the sore is cauterized, a piece of lint, dipped in a solution of watery extract of opium, one dram to four ounces, should be laid on it; and the organ enveloped in another piece of lint soaked in tepid water, and covered in oiled silk. The patient should remain at rest as much as possible, keeping the penis elevated, and repeating the opium dressing to the wound, and the water dressing to the whole organ, night and morning. In addition, the patient should take two pills (19), to be followed, night and morning, for three or four days, with a tablespoonful of (20). In some cases, a piece of lint, wet with the tincture of muriate of iron, diluted and kept upon the chancre will cause it to heal kindly, and with safety to the patient.

If this treatment be adopted *early* and *properly*, the patient is cured, and nothing further needed. But time is generally lost. The poison is absorbed before the patient is seen by the physician; and the question then is, how it is to be driven out.

To accomplish this, the diet should be regular and unstimulating; alcoholic drinks and tobacco should be forbidden; the mind should be kept at rest; a cold or tepid bath should be taken daily; the

action of the bowels and kidneys should be kept properly regulated. These things will put all the expelling agencies in proper condition for work; and no single medicine will put them all into action like mercury. For this reason, no other single drug has enjoyed a reputation for curing pox so wide as this.

But it must be used with judgment. No remedy is more safe, if judiciously employed, or more destructive if abused. Abuse *made* mercury a curse; judicious use *makes* it a blessing,—at least in this disease.

Of the many varieties of mercury we have to choose from the protiodide known as the yellow iodide can be handled best. It may be obtained in one-sixth grain pills in bottles of one hundred, and beginning with one pill at meal time worked up by degrees to six a day. For example, the first week one pill morning, noon and night, the next week two in morning, one at noon and one at night; the following week two in morning, two at noon and one at night, etc. If symptoms of “mercury saturation” appear such as sore, or bleeding gums, dripping of saliva from the mouth, griping pains in the bowels or diarrhoea, then immediately drop back to three or four a day and find the limit of each individual. The point is to find how much the patient will take and then keep that dose constantly for three or four months. At the end of that time the iodide of potassium may be used in conjunction with the mercury. The form of the “mixed treatment pill, Number 2,” compounded by eight or ten reputable chemists is very useful. Each pill contains:

Iodide of Potassium,		2 grains.
Syrup of Iodide of Iron,		5 minims.
Corrosive Sublimate,		1-64 grain.
Solution of Arsenic and Iodide of Mercury,		2 minims.
Tincture of Nux Vomica,		2 minims.

And the dose is three to six pills during the day, or if a solution is desired:

Iodide of Potassium,		4 drachms.
Corrosive Sublimate,		1 grain.
Compound Syrup of Sarsaparilla,		4 ounces.

Give one teaspoonful in water after meals.

This treatment is continued for nine months steadily, then for the next six months to a year it is taken on alternate months and if faithfully carried out the patient may rest assured that he has followed the line of treatment that science has found to give the best chance to escape the clutches of the most loathsome as well as one of the most prevalent diseases known since the beginning of the world.

In the third or tertiary stage, where the bones are affected, where the mind gives way, as in dementia and paresis, or the muscles refuse to obey the bidding of the brain, as in locomotor ataxia and kindred spinal chord troubles, enormous doses of iodide of potassium, even to six hundred grains a day may be used.

Salvarsan, "606".—Of equal efficiency to mercury is salvarsan, or "606" as it is sometimes called, a chemical (Dioxydiamidoarsenobenzol) having a specific action on the *spirochæte pallida*, or syphilis germ, which was introduced by Ehrlich. "606" was hailed at first as the "sure cure," but later reports, while crediting the drug with results which are sometimes marvelous, advise caution in its use. The great value of mercury must not be lost sight of. Indeed it is probably through the combination of the two drugs that we shall be able to check this disease. Only a physician can apply 606 to the patient, as it has to be injected into the veins.

The Bubo, if not attended with pain, may be treated with compression, by a piece of plaster of ammoniac with mercury, or by touching it with nitrate of silver. Should there be inflammation, and the formation of matter be inevitable, the bubo should be opened by touching it with the caustic potassa; and the resulting sore must be treated with the solution of opium and water dressing. Should the sore need stimulating, it may be touched lightly with nitrate of silver.

Eruptions upon the Skin.—In treating the disease after it appears upon the skin, etc., we shall derive great advantage from the use of either the warm or the vapor bath once a day. With this, if the case be not very old, we may employ (148) or (150); but if the disease be an old one, showing itself in the throat, or attacking the bones of the face, we must give iodide of potassium (138), combined with compound decoction of sarsaparilla. This is the great remedy for tertiary syphilis; but when the case is obstinate, it may sometimes be discontinued, and the corrosive sublimate (139) be substituted for it.

It is to be observed that the older the disease grows, and the more chronic its character, the more does mercury lose its control of it. In the first attack, the blue pill is the best; in the second, as a general thing, the iodide or the biniodide of mercury; in the third, the corrosive sublimate; in the attacks subsequent to this, particularly in the tertiary form of the disease, the iodide of potassium. When the throat and nose are so ulcerated as to make a case absolutely terrible to contemplate, it is surprising to see how rapidly the recovery will often take place under the influence of this latter remedy.

For syphilitic iritis, apply frictions twice a day on the eyelids and eyebrows with ointment (172), (173); and administer internally two pills of (136) daily.

Clap. — Gonorrhœa. — Blenorrhagia.

THE reader is aware that the nose, mouth, and lungs are lined with a mucous membrane, which is liable to become inflamed from various causes. This inflammation we call a cold or catarrh. During its continuance, mucus and other matters, of different colors and degrees of consistency, are more or less freely discharged.



Fig. 2.



Fig. 1

The mucous membrane of the private parts of both sexes is just like that of the mouth and throat, and subject to similar inflammations and discharges. But these inflammations of the private parts, instead of being produced by change of weather, etc., generally result from the application of the specific poison or germ-microbe of gonorrhœa. When a woman abandons herself to unlimited intercourse with different men, the private parts become stimulated to so unnatural an extent, that the secretions of the parts, which are largely augmented, at length become altered in their nature, acrid, and finally poisonous, — so acrid and poisonous that they cause inflammation of the parts, and when brought in contact with the male organ, in the sexual act, they poison and inflame that. The specific germ of gonorrhœa is called the gonnococcus.

This is the shortest and plainest explanation I can give of clap. From this explanation, one may learn why a man will sometimes take a disease from a woman who has never had any evidence of being diseased herself. If she have indulged her sexual propensities unreasonably, though not enough to produce inflammation upon herself, her secretions may yet have become acrid enough to poison one whose organs are delicate and sensitive. And more than this, — the secretions of a female may become acrid and poisonous from other causes than excessive venery. The discharges in bad cases of whites will sometimes irritate and inflame the male organ, and induce a disease which has every appearance of gonorrhœa. A husband, in great distress of mind, sometimes submits a case of this sort to the physician's inspection, and lays upon him the delicate and responsible duty of deciding whether the wife has been unfaithful. No act in a whole professional life can be more momentous than a decision of this sort. If a man be well skilled in his art, he may give an answer in such case, which shall dispel the most terrible apprehensions, and save the peace of a loving family.

The poison, when communicated by a diseased person to the male or female organs, requires a certain time for the germs to produce their peculiar effect, — generally from three to eight days.

Symptoms. — The first *symptom* of the disease is uneasiness in the end of the penis, accompanied, generally, with a little redness, and difficulty in passing water. The color of the first discharge may be white or straw-colored. There is tenderness where the parts are red. Scalding in passing water is sometimes, not always, present at first.

This is the beginning, or first stage of clap. Now is the time to cure it easily. But, unfortunately, the physician seldom sees a case in this early stage. Before he is allowed to inspect it, the second stage has generally appeared, which is known by violent scalding when water is passed, by chordee, or painful erections of the penis, and by an increased discharge of greenish matter often tinged with blood, and coming from much farther down the urethra, or water-passage. The matter sometimes comes from as far down as opposite

the scrotum, or bag which holds the testicles. There is more or less pain the loins and back. The whole body of the penis may become affected, and abscesses form.

A third and more terrible stage of the disease begins when the inflammation has reached the lowest part of the water-passage, just where it enters the bladder. Around this part of the passage, and lying upon the bladder, is a gland in size and shape like the largest chestnut. It is called the *prostate gland*. On either side of it lie the receptacles of the semen, each of which sends its duct into the water-passage. When the inflammation extends through this gland, it irritates the neck of the bladder, and causes a distressing desire to pass water; and from its proximity to the larger bowel, it sends its irritation thither likewise, and impels a terrible effort to evacuate the bowels, called tenesmus. It is the same awful feeling experienced in dysentery. Few things can be more terrible than these two distressing feelings conjoined,—the desire to pass water and to empty the bowels. Racked with terrible pains and awful tenesmic distresses, and often with painful erections, the patient passes back and forth between the bed and stool,—often vowing in the sincerity of his heart, that if he can but recover from this, he will never be caught again. The enlargement of the prostate gland may become chronic and permanent, and be the affliction of a man's life.

Stricture.—One of the most troublesome and persistent consequences of gonorrhœa is a partial closing up of the water-pipe, attended generally by quite a serious obstruction to the passage of the water. It is called *stricture*. The mucous membrane which lines this passage, being long inflamed, becomes thickened and less pliable or elastic. The tissues which lie underneath this membrane also become swollen and hardened, and, pressing upon the water-passage, lessen it still further, making the stricture more difficult of cure.

In stricture, the stream of urine is altered in size, length, and force. Its course is changed, when the stricture is lateral. The stream is often flattened, like the blade of a pen-knife, or twisted like a gimlet, or forked, one stream reaching beyond the other. In consequence of obstruction, the bladder is not entirely emptied, and the desire to urinate immediately returns, and is very urgent.

Gleet.—Another very troublesome result of gonorrhœa is *gleet*,—a thin, colorless discharge, which persists, in a chronic form, after all active inflammation has subsided. It is very annoying, and very obstinate. It is often dependent on the altered condition of the mucous membrane occasioned by stricture.

Orchitis.—Another very severe result of clap is swelling of the testicles, called *orchitis*. It begins frequently with chills and fever, with a feeling of weight in the scrotum, and pains in the loins. The swelling rapidly increases, and reaches its height in from three to five days.

Besides the above, there are still other mischiefs which follow this disease, such as inflammation of the prostate gland, already described, of the bladder, and of the kidneys.

In the female gonorrhœal inflammation affects the external genitals called the vulvæ, the water-pipe, the vagina, and the neck of the womb, and often plays havoc with the ovaries and Fallopian tubes. In women the disease is often fatal by ascending the tubes and penetrating to the abdomen, where an acute peritonitis is set up, with the formation of pus.

There is a difference of opinion as to whether gonorrhœa ever produces secondary or constitutional symptoms. Ricord, the great French authority on this subject, affirms, and with him a great number of followers, including most of the profession in this country, that constitutional symptoms never follow clap; that they never result from anything but a *syphilitic ulcer*. Vidal, a French authority, safer, in my judgment, than Ricord, though not as renowned, says, on the contrary, that secondary and tertiary complaints do follow virulent gonorrhœa. Wilson, the highest English authority, and many others, agree with him. Unprejudiced observers feel well convinced that this latter opinion is right. I have myself seen not less than half a dozen cases of secondary and tertiary syphilis, which were preceded by gonorrhœa, and nothing more.

Treatment.—One treatment is by injection in the early stage. It is not often used except by a physician and consists of the injection of *nitrate of silver* in weak solution carefully used ($\frac{1}{2}$ grain to 2 ounces) or some other silver salt such as *argyrol*, 20 grains to two ounces injected in teaspoonful doses twice a day. Argyrol is less irritating, less astringent and fully as efficacious as silver nitrate.

The physician should have entire control of the patient, and compel him, if possible, to keep his room, and live for a few days on crackers and water, or something equally simple. All meats and stimulating drinks are to be excluded.

The other mode of treatment, which is perhaps the more commonly adopted, is more general in its nature. It embraces the use of warm baths, warm sweating drinks, and rest. These things, with a low diet, will frequently reduce the disease in a few days. If the discharge should continue, after a fair trial of the above, then copaiba and cubebs (272) are to be used. Several articles are added in the above prescription, to make the copaiba acceptable to the stomach. This preparation can be taken by most persons, and generally produces very gratifying results. Vidal strongly recommends an electuary, or thick paste (273), of which a piece twice as large as a nutmeg is to be taken in the course of the day. The prescriptions which contain copaiba and cubebs are numerous; but the above two are as good as a hundred. With these articles, the baths, the leeches, and the *repose*, are to be united.

Vidal says he never resorts to injections first, but employs the anti-inflammatory course first. If that fail, then he uses the injection (207), three or four times a day; and if he employs the nitrate of silver at all, it is only as an astringent (208). Prescription (304) is a valuable injection.

When the second stage sets in, and the symptoms become more violent, injections must not be used. For the very severe scalding in passing water, which is now felt, take thirty drops of a solution of potassa in half a tumblerful of water, twice or three times a day. Persons of full habit may be benefited by dissolving a grain or two of tartar emetic in a tumbler of water, and taking to the extent of producing a little nausea. Relief is occasionally obtained by holding the penis for some time in warm water.

For the painful chordee, or erections, camphor and opium (120) are required,—from one to three pills a day. Thirty drops of laudanum may be given when the patient retires. Cold applications to the genital organs, or walking barefooted upon the cold floor, will frequently give relief. When other things fail, three pills a day may be taken of extract of hyoscyamus, containing from one to four grains each. The quantity of drinks must be diminished, and cold lotions must be applied to the penis on going to bed,—the patient covering himself lightly.

It must be borne in mind that the quacks depend on strong injections to stop the discharge, but they almost invariably cause stricture which is worse than the original disease and that the average time that will elapse before a cure is effected may be from four to six weeks.

Gleet is generally very obstinate, and often requires a very protracted treatment. If there be any tenderness along the under side of the penis, recipe (272) will be good. But gleet is an unhealthy action, sustained by habit, and may often be cured by simply exciting a new action which shall break the old habit. It is always well, therefore, to resort to injections. Sugar of lead and sulphate of zinc (207) answer a good purpose; or sulphate of zinc and tannin (209) may be tried. Chloride of zinc (210) does well in some obstinate cases.

But gleet is often dependent on *stricture*, and when this is the case, we must learn the location of it by exploring the water-pipe with a bougie. When the instrument reaches the constricted part, the patient feels pain, or the surgeon meets an obstruction,—often both. When the stricture is found, it is either to have the solid nitrate of silver applied to it with an instrument called the *porte caustique*, or a solution of nitrate of silver (211), or of acid nitrate of mercury (226), with a shower-syringe. When these means fail, we must pass a small bougie gently through the stricture; then a larger, and then a still larger one, until the obstruction be removed. They should be used once or twice a day, and not be retained long in the passage. They frequently have to be used ten or twelve weeks, and should

not be discontinued till the cure is complete. Put no confidence in those quacks who promise to cure these old troubles in a few days. They want your money, but have no expectation or ability to cure you at all.

For inflammation of the testicles, apply leeches at once. To this should be added warm fomentations and poultices. If these means fail, more serious measures are to be adopted, which it would be out of place to describe in this book.

Inflammation of the prostate gland is also to be treated with leeches and poultices; likewise a warm hip-bath. The water must be drawn off with a catheter until it can be passed in the natural way.

Prevention of Sexual Diseases.—I have several times been in doubt as to the best method of presenting some of the topics which the wide scope of this book has brought before me; but no one subject has perplexed me like the one announced in the above heading,—not that it is not easy enough to furnish the rules for preventing venereal disease, but that it is a grave question in morals whether to instruct the world in the methods of such prevention is right. Is it proper to give any other advice than the simple direction to abstain from all liability to disease? That is the question.

If such advice would be heeded, of course no other should be given. But it would not. If the person disregarding it would alone suffer the penalty of the transgression, it might then be best to embody the whole advice in the simple imperative word, *abstain!* But this cannot be. The infection will be imparted to a third person, and onward to thousands; and many of these thousands will be innocent wives, who will perish of the disease, or send the infection down to the second, the third, the fourth, and to all generations! While a strict morality might seem, therefore, at first view, to forbid the inculcation of rules for avoiding infection, the good of the race would appear to justify and require it.

The first requisite for prevention is cleanliness. Frequent washing is of prime importance.

The precautions should not be the same before and after the venereal act, when a person is about to expose himself to risk. Before the act, the parts should be carefully examined to see if there be any break in the skin. The least breach in this covering of the penis greatly promotes contagion. Before coition, there should be no washing with soap, for this deprives the parts of the mucus and oil,—thus rendering the naked and exposed skin liable to infection. On the contrary, to apply a solution of alum, tannin, or a decoction of oak-bark, or aromatic wine, constricts or hardens the covering of the organ, and renders contagion more difficult.

Of still greater importance are prompt measures of prevention *after the act*. Lotions should be immediately applied to every part of the organ, and in the case of females, should be used as injections. These lotions should be acids or alkalies. A mixture of vinegar and water has been recommended as an excellent wash. Ricord recommends aromatic wine; Malapert, corrosive sublimate (212), in the form of solution. Probably the best preventive is composed mainly of alcohol and soap (213), as recommended by Langlebert.

An exposed person, using any one of these solutions, particularly the last, or, in the absence of all these, washing thoroughly with soap and water, will be likely to escape contagion.

Medical Police. — What is called general prophylaxis, or prevention, or medical police, is not a subject of legislation in this country. The moral sense of the American people does not admit its necessity. In Europe, the authorities watch over prostitution. They even go so far as to regulate it. They appoint practitioners, whose duty it is to act as a sort of medical police, and particularly to visit houses of prostitution once or twice a week, and examine all the inmates. When a girl is found diseased, she is immediately removed to a hospital, and not permitted to return until she is well.

Self-Pollution. — *Masturbation.*

THERE is probably no vice to which so many boys and young men, and even girls and young women, are addicted, and from which so many constitutions break down, as self-pollution. Small boys and girls learn the vile practice of the larger ones at school, and generally continue it up to maturity, without the least suspicion that they are inflicting upon themselves either a moral or a physical injury.

This comes of the false modesty and bastard morality which withholds from the young all knowledge of the proper functions of their sexual organs, and of the inconceivable mischief resulting from their abuse. A gentleman of distinction lately said to me: "I instruct my boys as faithfully on this subject as upon any other moral or physical question, and I tell my wife it is her duty to do the same with the girls." This is wise. Yet, how few parents ever speak to their boys or girls on the subject, to give them the least reason to suppose there is any better rule for their conduct than their own desires!

Symptoms. — These are very numerous. The principal are, headache, wakefulness, restless nights, indolence, indisposition to study, melancholy, despondency, forgetfulness, weakness in the back and private organs, a lack of confidence in one's own abilities, cowardice, inability to look another full in the face, and, among females, hysterics, whites, and a desire for seclusion from society and solitude.

I have already spoken of the receptacles of semen, lying on each side of the prostate gland. From the fore part of these receptacles, the semen passes through two ducts, about a finger's breadth in

length, into the urethra or water-pipe, just in front of the prostate. From excessive self-pollution, these ducts become very irritable, and also debilitated and relaxed,—so much so that they will not retain the semen; and during lascivious dreams, it flows off. These seminal losses are called “nocturnal emissions.” So constant is the drain they keep up upon many young men who have abused themselves excessively, that the whole man, mentally, morally, and physically becomes a wreck. There are few objects more pitiable to behold than a young man in this condition,—his nervous system feeble, tremulous, and broken; his memory weakened and fading out; his eye unsteady and incapable of looking a friend in the face; his loins and back weakened, giving him the feeble gait of old age; his once erect form cowed and bent; his high sense of manliness all oozed out of him; his mind taking up and dropping the simplest threads of thought, losing its way in the plainest paths of reflection, and often starting back affrighted at the glimpse of chaotic insanity opening before him,—turning here and there for relief, but finding little hope of recovery, except in marriage, and yet knowing himself unfitted to be the husband of an intelligent woman!

Treatment.—Every kind of treatment, no matter how judicious or well applied, will be unsuccessful, unless the vice which has produced the disease be absolutely and entirely abandoned. This is the first thing to be secured. It may be extremely difficult for the patient to do this, with his mental and moral nature all broken and in ruins,—with no heart to feel, nor will to execute; and yet it must be done, or a cure cannot be effected.

To bring this about, everything must be done by the physician to strengthen the moral nature of the patient, and to raise his self-respect and hope. The most careful directions must be given for restraining the imagination. The patient must be directed and encouraged to drive out from the mind, instantly, and upon all occasions, every lascivious thought; to cultivate the society of the most intellectual and virtuous females; to make himself *busy* with useful and, if possible, *agreeable* employment; to avoid solitude; and to sleep with some friend. He should sleep on a mattress, and never on feathers; always on the side, never on the back.

Where there is considerable debility, tonics will be required, as the mineral acids (60), (62), (78), and bitters (77), (67), (66), (59), and strychnine (83), (95), (85), and iron (80), (93), (72), (73), (71). In addition to some of the above preparations, the syrup of the hypophosphites should be taken for some time.

The food should be nutritious and easy of digestion, and the cold alkaline sponge-bath should be taken once a day, with brisk rubbing; and the private parts should be washed daily with cold water, especially just before retiring.

In conclusion, I say emphatically to parents, do not let your sons and daughters remain ignorant on this subject. It is plainly your

duty to enlighten and to warn them. It is a matter in which young persons are generally disposed to do right, if rightly instructed. Avail yourself of your right to give counsel, and, if need be, to use authority.

Says Ware: "The deleterious, the sometimes appalling consequences of this vice, upon the health, the constitution, the mind itself, are some of the common matters of medical observation. The victims of it should know what these consequences are; for, to be acquainted with the tremendous evils it entails, may assist them in the work of resistance.

"To you, parents, on whose shoulders is carried the weighty responsibility of rearing your children in a pure atmosphere, let me say that to shut your eyes against the probabilities of youth is an error and a sin. Let the mother learn to know the restlessness and activity of youth; let the father recall his early ambitions, his longing for excitement, and his reaching out after life and activity in various ways. Do not repress these natural instincts, but learn to guide them into proper channels. Keep at home the attractions of public places; have music and games, mirth and gayety; invent amusement and mirth, and banish dullness and apathy. Do not argue that your boy is better than other boys and your daughter superior to your neighbor's frivolous girls. The boys and girls guilty of this vice are somebody's children, and these somebody's children are nine to one your children. See that your children lead an active, physical life, that out-door games and gymnasium exercises enter largely into their lives; keep them busy, give them something to do to occupy their attention beside their studies; let them study with a will when they study, and play equally hard when they play. Do not be afraid to talk on these matters with your children, and explain in a rational way what passion is, and how it is to be governed and how used. If you have that unfortunate amount of prudery and false shame so common to many people, and feel you cannot talk with your children about such matters, send them to your family physician and let him have a plain honest talk with the children. 'Well stated information never yet contributed to human inflammation.' Read them Storer, Ware and Wilder on 'What Young People should Know,' and make them realize that a 'healthy knowledge is the best preventive against an unhealthy ignorance.' Do not wait till the young have already grown up in the vice, — your admonitions may then be too late, — nor fancy your children have not been thrown in with influences which corrupt, and that by broaching the subject to them you are informing them of a subject they may never otherwise have heard of. Remember the statement: 'whether or not we ought to hide this subject from the young, if we could, the truth is, we cannot if we would.'"

To you, young men, in particular, let me warn you against a seeming propriety on your part to keep your silence. If you are given

to the habit, however slightly, go to your father, your mother, your family doctor. Confession will strengthen your will and purpose to overcome the temptation. Do not lie to the family physician in his inquiries: he is your friend and wishes you only success; he is acquainted with these ailments and knows your temptations; he appreciates and respects your noble desire to rid yourself of the evil.

Do not, above all else, read the numerous pamphlets on Sexual Debility, Lost Manhood, etc., or be duped into answering advertisements in the public prints offering to send you literature on the subject. No man can afford to send you free publications and postage-stamps unless he sees as an outcome a fee at the end of the book in the shape of medicines and other promised help. Steer religiously clear of these smoothly written books and these specialists in the art of restoring lost manhood. Your experience with them will be much like the countryman with bunco-steerers.

Make every honest endeavor to conquer an unruly passion while it is young, and the more readily conquerable, but never despair of being helped by suitable aid, however long the passion may have been victorious over you. Do not ascribe your weakness in fighting temptation to the Almighty, the sins of your parents, or the example of your elders or associates, but go at the demon with a will and the fight is yours. Having conquered the enemy, the results of the past can be overcome by a pure life and the dictates of your physician; nay, I may even add, Nature restores herself if only she can be assisted. In fact there is no specific for the troubles that arise from this vice. The only cure is to absolutely stop the habit and immediately thrust out all lascivious thoughts as soon as they enter the mind. Build up the strength and in time nature and marriage will do the rest.

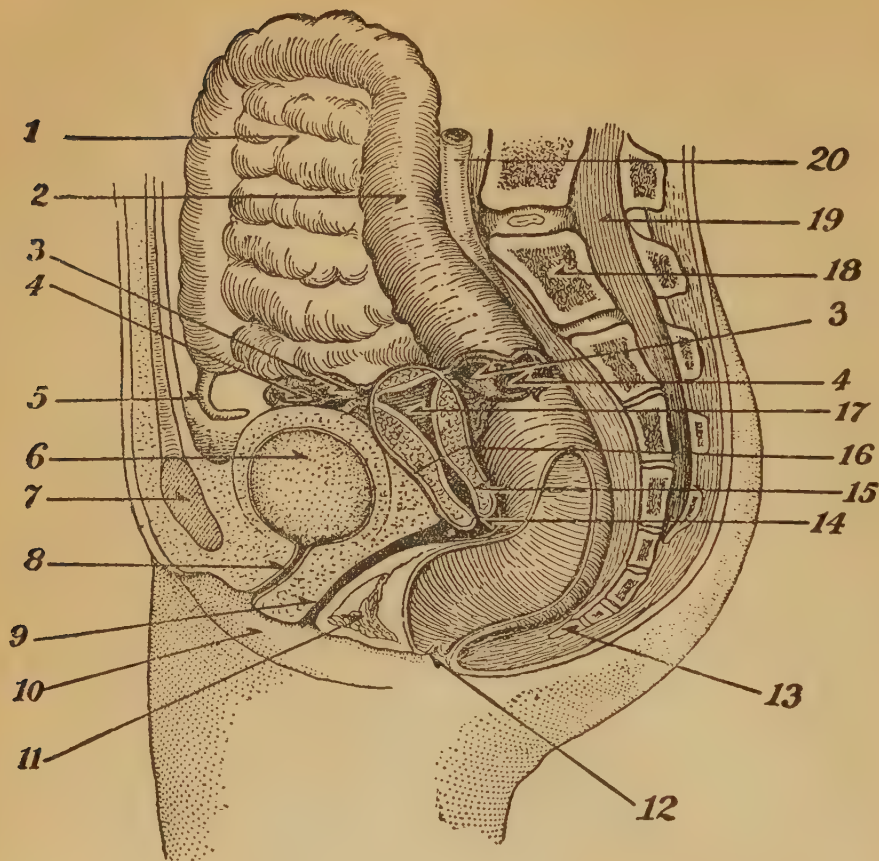
Chordee.

Chordee. — Painful erections of penis.

Cause, inflammation, usually gonorrhœa.

Treatment. — Aconite, 1 drop every hour; camphor in full doses; hot Sitz bath; suppositories of opium and belladonna. Usually disappears as causative disease clears up.

Genital Organs of the Woman.



- | | |
|----------------------------------|-----------------------------------|
| 1. Intestines. | 12. Rectum. |
| 2. Colon or large Intestine. | 13. Coccyx. Lower extremity of |
| 3-3. Fallopian Tubes. | Backbone. |
| 4-4. Ovaries. | 14. External Os or Mouth of Womb. |
| 5. Appendix. | 15. Neck of Womb, a portion of |
| 6. Bladder. | which extends into the Va- |
| 7. Pubic Bone. | gina. |
| 8. Urethra. The channel through | 16. Dividing. Line between the |
| which the urine is expelled | Body and neck of Womb. |
| from the Bladder. | 17. Body of Womb. |
| 9. Vagina. The canal extending | 18. Spinal Column or Backbone. |
| from the Vulva to the Womb. | 19. Spinal Cord. |
| 10. Labia Pudendi. The thick or- | 20. Blood Vessel. |
| ifice of the Vulva. | |
| 11. Perineum. The parts between | |

FEMALE DISEASES.

IN addition to the diseases common to both sexes, women are subject to a class of distressing complaints peculiar to themselves, and denominated, in general terms, female diseases. Involving considerations of a delicate nature, these complaints have too generally and too long been shut out from works intended for popular distribution. Hence there is a general ignorance of a class of diseases which are fast unfitting woman for the high duty of continuing the race; and the subjects of these maladies are generally themselves so uninformed of the true nature of their sufferings, that they are neither prepared to seek relief in the proper direction, nor to submit to the remedy if it chance to be proposed.

It is intended here to speak of these disorders, as I have done of all others, in a plain and simple way, to describe them, so far as the present state of medicine permits, just as they are, and to make known the modes of treatment which have been found available for their cure. The sufferings of woman require this; the interests of humanity require it; and the writer is impelled to it, as he thinks, by a just sense of responsibility.

Physicians, in my judgment, are chargeable with a great wrong in concealing within their own breasts information upon what are called delicate subjects, — information which the good of the world requires should be divulged, and which they ought to pour into the public mind, and make common, and which they would thus popularize, but for their stiff pride and conservatism.

The idea that our knowledge cannot be imparted to the world without injuring the public morals, is simply absurd. We are more afraid of bringing the common people too near to us, of letting down our dignity, and of opening our profound secrets to popular eyes. The result is as it should be, that unsophisticated people are apt to give physicians a wide berth, and to have nothing to do with them unless necessity compels. Let doctors strip off their reserve, and while they remain gentlemen, become likewise companions, imparting their knowledge freely and familiarly to all, and the public confidence, now considerably shaken, will be frankly restored to the profession.

It should be the object of a good physician to know all he can, and

to impart his knowledge to as many as possible. Knowledge is not merely power: it is happiness, it is wisdom, it is health, it is virtue; yes, it is always virtue, except in some rare instances, where the worst natures pervert it. No physicians are so much loved as those who are frank, and have no concealments. The day for mysterious nods of the head, and rollings of the eyes, and shrugs of the shoulder, has gone by. Men, and women too (or those of them who are wise), wish to know distinctly what their diseases are, and what is necessary, not to palliate and prolong, but to cure them.

Time when Female Diseases Begin.—Female complaints begin to make their appearance at the period of life called puberty, — the time when the girl passes from childhood to womanhood. This is the period when *menstruation* is established, which consists of a discharge from the genital organs, composed of blood and mucus, and which occurs, when regular, every four weeks. Up to this period, the system of reproduction has remained dormant. By the intervention of this mysterious function, the young female becomes a new being. The heart unfolds itself to new emotions; the mind assumes a solidity before unknown, and even the body acquires beauty from a sudden retundity of form.

This is the period when the great question of female health is very apt to be settled once for all, and for life. The girl who is well trained at this time, generally has a foundation laid for health and character, which is worth more to her than riches. At no time does the mother need so much wisdom and knowledge as now. To establish the health and develop the affections of the daughter at this critical period, is a sacred trust which she can devolve upon no other being; nor can she meet her responsibilities at this time, unless better informed than most mothers are. The general apathy in regard to this maternal duty is deplorable.

False Delicacy.—The refined delicacy which withdraws these subjects from the public gaze is commendable, for it casts a beautiful charm over society; but when carried so far as to cast a veil even over the eyes of mothers, it is quite unnatural, and leads to the worst results; for in the bad management of girls at this critical period is laid the foundation of so many of the diseases which shatter the constitution of so many women. For this bad management, it is not mothers alone who are to be blamed. The neglect of the medical profession to furnish the necessary information should come in for its full share of reproach.

The Establishment of the Menses.—Nature always comes slowly and by degrees to the inauguration or establishment of any of her great functions. It is so in regard to menstruation, or, as it is variously called, “the menses,” “the courses,” “the change,” etc. For some time before the flow begins, there are certain symptoms, or premonitions, which to the eye of the physician plainly enough foretell

the impending change. To the mother these signs would be equally intelligible, were she as well informed as she should be. It is plainly her duty to be intelligent enough to assist nature in the establishment of this important function. But how often, either from ignorance or from false ideas of delicacy, does she fail to interfere, and allow the daughter to be taken by surprise, and perhaps frightened and thrown into convulsions!

From inquiries made of about one thousand women, a distinguished English physician found that about one-quarter were unprepared for the appearance of the menses. Some of the girls were frightened and went into hysterical fits; others thought they were wounded, and washed with cold water. The flow was stopped in several cases, and in some never restored; while the health of all in whom it was interrupted was seriously impaired.

Symptoms of the First Menstruation. — A variety of symptoms precede and foretell the first menstruation. Headache, dizziness, sluggishness of thought, and disposition to sleep; these occurring in a girl, may be taken as hints that the "change" is at hand. If to these be added pains in the back and lower limbs, the intimations will be still more significant.

At this time a girl loses a relish for the society of children; she is apt to acquire a taste for solitude; her temper becomes wayward and fretful; her eyes acquire a peculiar lustre; she becomes a sort of mystery to her friends and herself; not her physical frame only, her whole character is changed. She is about stepping into a new life. Her emotions, thoughts, anticipations, retrospections, are all new to her, and her outward manifestations are new to her friends. An intelligent mother will not fail now to prepare her mind for the important event close at hand.

The age when this change takes place depends very much upon a variety of circumstances. It occurs much earlier in warm than in cold climates. It is hastened by high living; by the whirl and bustle and excitement of city life; by reading novels which are full of love-incidents; by attending balls, theatres, and parties; and by mingling much in the society of gentlemen.

Early Menstruation not Desirable. — It is a law, both in animal and vegetable life, that the later the period at which maturity is reached, the greater the solidity of the body, and the longer it lives. Girls who menstruate early do so because the body is weakened by climate or luxury, and the nervous system unduly developed by excitement; while those who come late to womanhood have firmer constitutions, enjoy better health, and live longer. Those mothers, therefore, commit great errors, who are anxious and administer "forcing medicines," because their daughters do not menstruate at fourteen or fifteen. If girls are suffering from no special ill-health, no anxiety need be felt if "the custom of women" do not come to

them till the age of eighteen, or even twenty. The delay should excite thankfulness rather than regret. It shows that the constitution has not in it the seeds of early dissolution; that it is fortifying itself against future disease.

Girls who come thus tardily to maturity are much more "regular" in after life. They bear children with fewer accidents, and are afflicted much less with female diseases. The duty of mothers is plain: it is to bring their daughters forward as late as possible, by refusing their early admission to society, by withdrawing from them all exciting reading, by prohibiting their early attendance at parties and theatrical entertainments, by prescribing for them the most unstimulating diet, and by requiring a large amount of exercise in the open air.

A wide investigation has shown that the first menstruation occurs, in hot climates, at the average age of thirteen years and nineteen hundredths; in temperate regions, at fourteen years and seventy-four hundredths; in cold latitudes, at sixteen years and fifty-three hundredths. Under the hot-house culture of modern society, and especially among the wealthy classes, where indolence, luxury, and excitement unite to weaken the constitution, this change is constantly occurring at a more tender age.

How Female Diseases are Induced. — All living things have their origin in *germs*. The germ from which the higher animals spring, man included, is an *ovum* or *egg*. Every animal and every vegetable is provided with an organ for the production of germs. In woman, this organ is called an *ovary*. There are two ovaries, about half an inch in length, one lying on each side of the womb, to which they are attached by ligaments or cords. The ovarian bodies contain vast numbers of vesicles, or cells, or eggs, which are the true germs of human life, and the only sources from which it can spring.

Between the ages of fourteen and forty-five (speaking in general terms), every healthy woman matures and deposits an ovum once in twenty-eight days. This vesicle, some time before the monthly flow, begins to germinate and swell, and after a time, like a grain of wheat in the earth, it bursts its covering and springs forth. It then passes through what is called the Fallopian tube into the womb, whence it is cast off.

During the swelling and bursting of this vesicle or germ, the vessels of the ovaries and womb, and particularly of the membrane lining the womb and its neck, are so crowded with blood as to produce in the parts a state of congestion. If the parts be examined with a speculum at this time, they will be found red, sensitive, and almost inflamed. So great is this congestion, that the woman often complains of pain in the ovaries and the womb, and a general sense of heat, aching, and dragging down in the lower part of the bowels. The pain often extends to the back, the groins, and the thighs.

This Condition Repeated Every Month. — When we consider that this state of things is repeated every four weeks, and that the congested or crowded state of the vessels begins some days before the monthly flow, and lasts, in all, some ten days, making about one-third part of every month, we need not wonder that inflammation so often supervenes, with all its attendant ill-health and suffering.

Increased by Various Causes. — If we reflect, further, that this congestion is increased, among the wealthy, by high living, and among all classes, by over-stimulation of the nervous system, and by the lascivious morals of the age, we see stronger reasons for expecting — what is really occurring — a continually increasing amount of suffering from female diseases.

And when we know, still further, that American females are careless of their health; that they often attend balls and theatres at the very time of suffering from this monthly visitation; that they frequently wet their feet, and otherwise expose themselves to colds, we cannot feel surprise, even when we learn that from one-half to three-fourths of all women in cities, and quite a large proportion of them in the country, have inflammation of the ovaries, or of the womb, or of the neck of the womb, or suffer some of the forms of displacement of this latter organ.

Child-Bearing. — The inflammatory state of the uterine organs is often induced by injuries received in child-bearing, and by excessive indulgence in sexual pleasures.

Weakness of the Sexual System. — The womb, moreover, like any other organ, may be naturally frail, and easily affected by disease. This weakness of the sexual system is indicated by the difficulty with which menstruation is established, and the presence of the whites, both before and after each monthly flow. Women in whom the generative organs are weak, are much more liable to inflammation of the womb, and to all complaints peculiar to the sex.

Description of the Sexual Organs. — Before describing the particular diseases to which the female generative organs are liable, it is proper to give the reader a brief description of the chief of these organs.

The Womb itself, in its healthy, natural state, is about two inches long, and one inch broad — weighing a little more than an ounce, and is in shape like a pear. It is lined with a mere rudimentary mucous membrane.

The Neck of the Womb has a cavity distinct from that of the body of the organ, and is lined with a mucous membrane well supplied with follicles or glands.

The Fallopian Tubes open, one from each side of the base, or largest end of the womb, and extend outward to the ovaries.

The **Ovaries** are glandular bodies lying one on each side of the base of the womb. They are more particularly explained elsewhere.

Fig. 136 gives some idea of these organs. A, is the body of the womb; B, the neck of the womb; C, C, the vagina; D, one of the

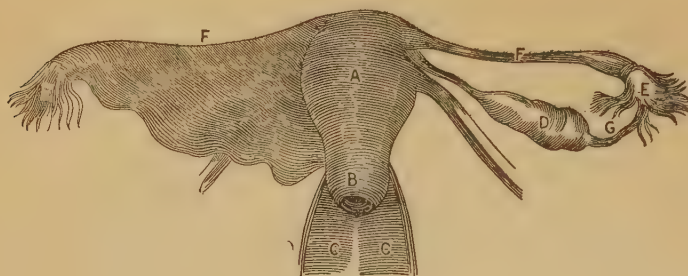


FIG. 136

ovaries; F, F, the Fallopian tubes; E, E, the fimbriated extremities; G, the small ligament attaching the fimbriated extremity to the ovary.

Inflammation of the Neck of the Womb.—Inflammation of the body of the womb is a comparatively rare disease, but inflammation of the *neck* of this organ is so common that in nearly nineteen out of twenty cases, when females seek relief for whites, for painful menstruation, for stoppage of the menses, or even for what they suppose to be a falling of the womb, a careful examination will show that this pendant portion of the womb is in a state of marked inflammation, or of absolute ulceration. The whites, if they continue without intermission from one menstrual flow to another, are almost always the result of one of these conditions of the uterine neck.

It would surprise most persons out of the medical profession, and many physicians, to know how large a proportion of the more grave diseases which inflict such terrible suffering upon woman, and so completely shatter her constitution, are dependent for their existence upon a simple local inflammation, either in the neck of the uterus, or in one or both of the ovaries. Many a female has for years suffered agonies, greater than those of death itself, arising, as she supposed, from a complication of ills which invade every part of the system, while the whole of her troubles arose, in fact, from an inflammation of the neck of the womb merely.

Difficulties of Studying Uterine Diseases.—The social relations of the sexes, and the great delicacy of the matters to be investigated, for a long time prevented direct examination and investigation, so that little knowledge was gained, and as little benefit conferred.

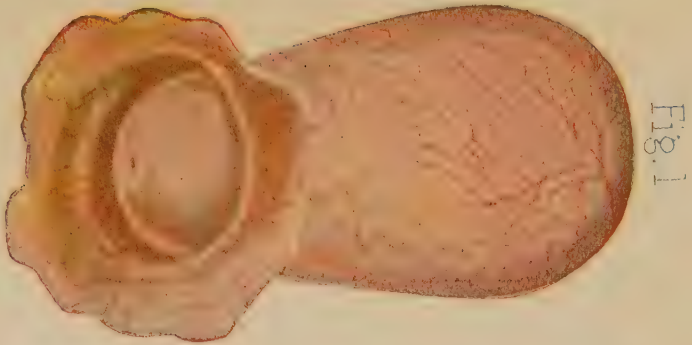


Fig. 1

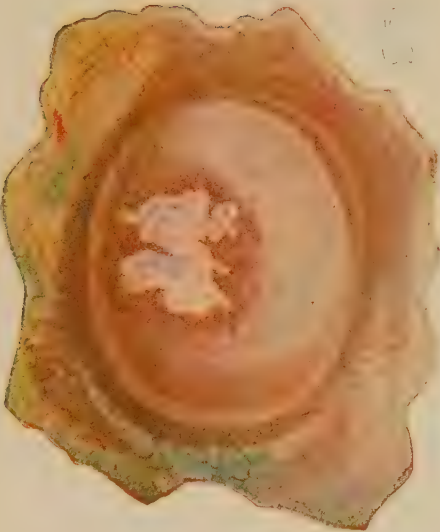


Fig. 2



Fig. 3



Fig. 4

Woman, always distinguished for her modesty, could not be expected to invite investigations which were not proffered, whatever the extremity of her sufferings; and man, scrupulously sensitive lest he should make himself an intruder by stepping within delicate enclosures, have both, in times past, mistaken their duty by misinterpreting the demands of the highest delicacy.

Needful Examination not Indelicate. — Rightly viewed, no inquiries or examinations are indelicate which are necessary to a full understanding of the nature of disease, and which are made with the sole purpose of rendering its cure possible. I agree with Dr. Meigs, the elder, that the delicacy or indelicacy of examining the persons of females for the purpose of exploring disease, depends on the motive with which it is done. To pure-minded persons, it is never, I think, a source of impurity. On the contrary, the self-restraint, the honorable feeling, and the nice sense of delicacy which it calls into exercise, often heighten the tone of a man's virtue, and certainly increase a true woman's respect for it. Unfortunately, there is now and then a gross-minded man in the profession, who, in these investigations, will violate the most sacred of all trusts committed to his hands; but such monsters — few in number — soon find their level, and are shunned as the most vile of the race.

It is now so well understood that these investigations do not lead to immoralities, that the most highly educated, intelligent, refined, and virtuous females almost invariably raise the fewest objections to such examinations as a physician of character may propose.

Methods of Investigating Female Diseases. — The symptoms of these complaints will be spoken of in their proper place, as the several diseases come under a brief review. I merely wish to allude here to the methods of physical exploration which modern practice has called to its aid.

The Touch. — These methods consist, first, of what is called the *touch*, which is made either externally upon the bowels, or internally, with the index finger, through the vagina, or passage, from the external genital organs to the neck of the womb.

The Speculum. — In the second place, of ocular inspection of the vagina and neck of the uterus, through an instrument called the *speculum*. By this instrument, the eye, as well as the finger, is made to assist in learning the real condition of the parts.

The finger informs us whether there is any devia-



FIG. 137. Sims' Speculum.

tion from nature in the bulk, the firmness, the smoothness, or the sensibility of the parts; while the *sight*, through the speculum, affords absolute certainty as to whether the parts are suffering from inflammation, ulceration, abrasion, or eruption.

There are a variety of specula in use by modern physicians, but all are essentially of two kinds; first, a so-called Sims' Speculum (Fig. 137), the end of which, when inserted into the vagina and pulled upon, allows the air to enter and balloons out the vagina so that the parts can be readily seen. This speculum necessitates what is known as Sims' position, i. e. the woman's hips resting on the edge of the bed or table, knees flexed, and chest resting on bed with left arm out from behind her.

The second variety of speculum is what is known as the duck-bill pattern (Fig. 138). By a separation of the two blades, the neck of the womb slips in between them. The speculum is then fastened with a thumb-screw, leaving the hands of the physician free. This speculum is used with the woman on her back, and feet resting on the bed or table, with knees flexed.

We also give an illustration of an older kind, which is still used to some extent. The end is so shaped as to catch the neck of the

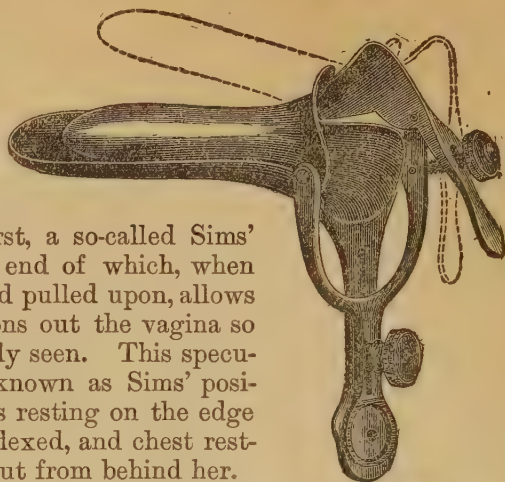


FIG. 138.
Duck-bill Speculum.

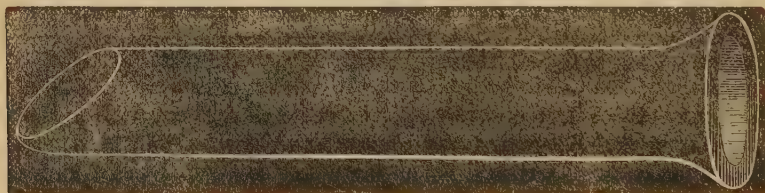


FIG. 139.

womb, and then by drawing the instrument forward slightly, the diseased surface is presented for as perfect inspection as if located externally (Fig. 139).

Inflammation, Ulceration, and Enlargement of the Neck of the Womb.

INFLAMMATION of the neck of the uterus is very common; ulceration and permanent enlargement (technically called hypertrophy), are its results, when it is not arrested in due time. These affections, in fact, and the same troubles as they affect the ovaries, make up the

bulk of female diseases, — being the real causes of the most of those symptoms which have passed under the name of whites, suppression, painful menstruation, sterility, general debility, etc.

The neck of the womb, when healthy, is soft and smooth. SEE COLORED PLATE A, FIG. 1. No hardness or condensation of tissue can be felt by the finger on pressing over it. It is elastic, too, and feels unctuous to the touch. This latter sensation is communicated by the layer of mucus which covers it. Pressure upon it produces no pain.

Inflammation, when found in this part, may begin in the mucous membrane which covers the neck, or in that which lines its cavity, or in the small glands in the body of the organ.

Symptoms. — Inflammation of the mucous membrane covering the neck of the uterus destroys the unctuous feel which it has in health. It also causes the neck to swell, its vessels being crowded full of blood. If the body of the organ, as well as the surface, be reached by the inflammation, it will be hardened and enlarged; and in consequence of its increased weight, it is apt to drop down somewhat into the cavity of the vagina. In married ladies, it is often, by physical pressure, pushed a little backward, or retroverted. Examination with the speculum shows the inflamed neck to be of a vivid red, instead of a pale rose-color. It may be covered with red or white pimples, which are glands enlarged with muco-pus.

In the healthy state, the mouth of the womb is so much closed as to be just perceptible when the finger passes over it. Inflammation causes it to be more or less open, and its lips to be parted.

Inflammation followed by Ulceration. — In a majority of cases, inflammation of the neck of the womb and of its cavity is soon followed by ulceration, which generally appears first around the mouth, and just within the cavity of the neck. From thence it spreads both inward and outward.

Various Degrees of Ulceration, etc. — Of course, these inflammations and ulcerations mix and run into each other in all possible forms, — presenting excoriations, or raw places; granulations, or pimply surfaces; and indurations, or hardened parts. Sometimes these pimply patches will be red and hard, and again the whole surface will be spongy, and will bleed upon the slightest touch.

In many cases, these ulcerations make wretched work with the mouth of the womb, eating deeply into the cavity, and giving it a ragged and unsightly appearance. SEE COLORED PLATE B, FIGS. 1, 2 and 4.

Velvety Feel from Ulceration. — Ulceration generally gives to the surface on which it exists, a soft, velvety feel, which the finger generally recognizes. This velvety sensation, with the open state of the mouth, are the most important evidences we can derive from the touch, of this form of disease.

The Discharge from these Ulcers is always Pus, or, in common

language, *matter*. It is sometimes poured out scantily, at other times very freely. It may be thick and yellow, or thin, and of a lighter color.

The inflammatory and ulcerated condition of the neck of the womb often gives rise to pain; and when the seat of the disease has not been examined, as it should be, this pain has frequently been called neuralgia. In this way, ignorance has compelled neuralgia to stand sponsor for a great many pains with which it has had nothing to do.

These Ulcers Disturb Menstruation.—Menstruation is generally changed more or less in its character by the presence of inflammation or ulceration in the neck of the womb. It usually becomes more *painful*. In some cases it is made more *profuse*, in others more *scanty*. It may come on more frequently, or it may be postponed, protracted, or aridged in its continuance. There is generally pain of a dull, aching kind, low down in the back. There is often a feeling of fullness, pain, and a sense of bearing down in the lower part of the bowels; sometimes the pain extends to the groins and thighs.

Extensive Disturbances from these Inflammations, etc.—The nerves with which the womb is liberally supplied belong to those of the sympathetic system. Hence, the condition of the uterus influences a wide circle of sympathies. By these nerves this organ is brought into close relationship with the organs of animal life. If the former suffer, the latter suffers also. The stomach, being intimately connected with the womb, physically, feels keenly these inflammations and ulcerations of the uterine neck. At times, the pain, debility, general disturbance, and dyspeptic state of the stomach are such as to cheat both the doctor and the patient into the belief that this organ is the seat of the disease. But in such cases, the symptoms of stomach disease will all disappear the moment the local affection is removed from the neck of the womb.

The liver, too, often participates in these troubles, and becomes sadly deranged. It is sometimes even greatly enlarged and congested, and patients frequently have the various symptoms of what are called liver complaints.

Severe pains are sometimes felt under the breast-bone, and over the chest generally, making the patient apprehensive of disease of the lungs; and indeed consumption is not a very infrequent result of uterine diseases.

Pains are often felt in the region of the heart, which organ is often harassed with palpitations.

The flesh is apt to waste under the symptoms excited by these inflammatory and ulcerative processes in the uterine neck; and even the brain, though lying in some measure beyond the circle of influences set in motion by the organic nerves, suffers disturbance and pain.

Even the special senses of sight and hearing may be drawn into this general vortex, and both be much impaired. And to crown this catalogue of ills, it may be mentioned that those distressing things called hysterical fits proceed from the same local disorders.

In brief, there is scarcely a point in the human body to which these inflammatory and ulcerative conditions of the uterine neck may not send their sympathetic pains and aches, and where they may not in time induce real disease. This is the reason why so many women suffering from these local complaints, tell the physician, when consulting him, that they are "*diseased all over.*" If asked where the complaint is located, they will answer, "*It is everywhere.*" In the most earnest manner the assurance will be given, "*Doctor, there isn't any well part about me.*"

Treatment. — It is just as unreasonable and useless to treat these inflammations and ulcerations through the stomach, as it is an inflamed or ulcerated throat. *They are local diseases, affecting a particular part, and the remedy must be local.*

Like all other affections, these can only be managed intelligently after their nature is well understood. Nothing can really be done towards a cure until it is known what the matter is; and no competent physician will move a single step in the treatment of one of these cases until he has made a thorough examination. He owes this to himself and to his patient, the more so as the neck of the womb may be as easily examined as the upper part of the throat, and the local remedy may be almost as readily applied in the former case as in the latter.

If, upon the introduction of the speculum, the uterine neck be found simply inflamed and enlarged, the application of ichthyol and glycerin to the canal will reduce the swelling and inflammation; while a tampon of wool soaked in the same and placed behind the womb will reduce the entire swelling of the womb by the watery discharges which are produced. The patient must learn to lie down most of the time.

One who is not accustomed to treat these affections in this simple way, will at first be surprised at the rapidity with which the local trouble will disappear, and with it the thousand and one aches and pains which torment the whole body. As the terrible pains in the whole face and head which are produced by a single tooth all instantly come to an end when the tooth is extracted, so do the bad feelings all over the body subside as fast as the local ailments of the uterine neck are cured. There is no exception to this rule, except where the sympathetic affection has become fixed by long neglect of the primary uterine disease. It is, therefore, surprising that so many excellent women, whose lives are of the greatest value to them-

selves and friends, should be permitted to perish of these ailments, when the cure is so simple, and many times so entirely within the reach of the most ordinary skill. It is a reproach to the profession which should be wiped away.

If there are a hundred motives for gaining the mastery over other diseases, there are a thousand for learning to control these. More than any other disease, or all others, they make the homes of men desolate, by robbing them of women, their ornament and solace. The physician who neglects to make himself acquainted with all there is to be known of these complaints, shows himself not only unfit for his profession, but deficient in some of the prime elements which combine to make a true man.

Hardening of the Uterine Neck.—In many cases the uterine neck is not only inflamed and enlarged, it is indurated and hardened. At times it is enlarged and hardened on one side, and not much on the other. In still other cases, there are enlarged spots, or nodes, giving the whole neck a *knotty* feel under the finger.

These hardened conditions of the uterine neck proceed from various causes, and are more difficult to cure than the ordinary inflammation, or even ulceration. They sometimes indicate cancerous disease, and then, of course, involve the most serious considerations. The glycerin tampon and the hot vaginal douche will do more for this hardening than all else combined.

Uterine Syringe.—For applying the several remedies to the internal cavity of the uterine neck, I have contrived a silver syringe, which is bent a little at the extremity, and pierced with fine holes all round. With this instrument, the remedy is carried directly to the diseased part, and applied instantaneously to every side of the cavity.

Besides the local applications, it is frequently necessary to resort to soothing or astringent injections into the vagina, hip-baths, and injections into the bowels, some mild physic, and rest in a horizontal position. These matters will all be judiciously regulated by the attending physician, if he is master of his business.

Inflammation, etc., of the Ovaries.—Ovaritis.

THE inflamed condition of the ovaries is indicated by increased heat, and pain upon pressure. The pain in the ovarian region is sometimes intermittent, sometimes constant, and occasionally passes down to the loins and thighs.

There are acute and chronic inflammation of the organs; but it will be sufficiently accurate, in a work of this kind, to treat of them as essentially one.

The effects of inflammation upon the ovaries, as upon other bodies, are various, sometimes enlarging and hardening, at other times collapsing and blasting them. This last effect, it is hardly necessary to say, cuts off all hope of bearing children.

The Causes of ovarian inflammation are numerous. One of the most important causes has already been noticed, namely the congestion of the parts, for several days, at every menstrual period. This, amounting as it does almost to inflammation, is often intensified by other causes, such as wetting the feet, taking sudden colds, excessive fatigue from dancing, and exciting drinks.

Sexual indulgence often proves a cause of inflammation in these bodies. It is particularly apt to have this effect in the newly-married female, with whom it is a novel stimulus, and often applied with immoderate excess. In late marriages, when the stimulus to the ovaries has long been denied, its sudden presentation is liable to make an inflammatory impression. Its entire *absence*, too, in persons of strong passions, may result in ovarian disease.

This inflammation may be produced by the new state of things existing at the critical period called *the turn of life*, when it reacts on the womb, producing the floodings which often bring menstruation to a close. The congestion, too, which has been present every month for many years, does not immediately cease at this change; and not finding relief by the accustomed flow, the ovarian bodies are exposed to inflammation.

In all large cities, the pest-houses of civilization, where the women are more numerous than the men, there are many females whose virginity is a burden, and numerous others who give themselves up to sexual excesses; to both these classes, the turn of life is very liable to promote these ovarian disorders.

There is another class of causes, which, though not so easily recognized, are equally cogent in exciting this form of disease. I mean all those excitements which arise from unbridled thoughts, from books of questionable character, from music, social intercourse, and stimulating food and drinks,—all which promote and intensify burning desires, which, though natural and proper in themselves, cannot lawfully be gratified in a community where the female sex greatly preponderates, numerically, over the male. When we consider how powerful within a woman's breast the conflict often is between the impulse of passion and the dictates of duty, and how strongly this conflict must react upon the sexual organs, and especially upon the ovaries, the centre of the sexual system, we can easily see in how many cases they may become inflamed.

Another cause of this disease is suppression of the menses. The engorged and crowded state of the vessels of the womb, of the uterine neck, and of the ovaries, not finding vent in the accustomed flow inflammation in any one of these organs is a very natural result.

The inflammation of these ovarian bodies is a frequent result, too, of a similar condition, previously existing in the neck of the womb. In passing from the uterine neck to the ovarian bodies, the inflammatory condition often fastens itself upon the broad ligament, the fallopian tubes, and their fimbriated extremities. The whole, it will be

seen, presents an amount of disease which it is painful to contemplate.

The womb being turned over, and pressing against one of the ovaries, may cause it to inflame by mechanical irritation. Pessaries, injudiciously used, may do the same thing.

Symptoms.—The first and most obvious symptom is a pain a little to the right or left of the womb. This pain is almost always increased by walking, riding, or by external pressure. It is especially augmented by straightening the thigh, by which the parts over the inflammation are put upon the stretch. When standing up, ladies suffering from this disease are generally compelled to rest the foot on a stool, so as to bend the thigh, and relax the muscles. The pains radiate from the ovaries, and go down to the loins and thighs, and sometimes to the fundament. They are of a dull, dragging, heavy nature.

Sometimes the ovarian bodies become very much enlarged, and dropping down somewhat, press upon the lower bowel, causing constipation, or upon the neck of the bladder, creating a frequent desire to urinate, and an inability to pass the water freely.

Treatment.—As inflammation of the ovaries is always increased during the menstrual flow, it is not proper to meddle with it at these, monthly periods, lest the trouble be aggravated. The parts over the pain should be rubbed for a few minutes, night and morning, with an alterative and anodyne ointment (169).

It is in many cases more desirable to insert a speculum and paint the roof and sides nearest the tender spot with tincture of iodine. There is a strong preparation called Churchill's iodine which is the tincture of iodine to which iodide of potash has been added, and though some greater care must be used when applying it, the results will be more rapid and beneficial.

After the next menstruation, the same things should be repeated, and again after the next, and so on, for five or six months, or even longer, if need be.

The bowels should occasionally be opened by some simple cathartic, for the purpose of removing all hard substances which may press against and fret the inflamed ovaries. The purgatives employed should be of the most cooling kind, such as salts or oil; while aloes and all harsh cathartics must be avoided.

Injections of tincture of belladonna and hyoscyamus are useful for quieting neighboring parts, and warding off external disturbances. They act like soft substances thrown upon the pavement in front of a sick man's house. A piece of flannel soaked in hot laudanum, laid over the ovary and covered with dry flannel, will give great relief and enable the patient to sleep.

The patient should be kept, as much as possible, in the recumbent position, lying upon the bed or the lounge, and should only be permitted to move about to such extent as will not irritate the inflamed parts.

Whites.—*Leucorrhœa*—*Fluor Albus*.

LEUCORRHŒA is from two greek words, λεύκος and ῥέω, and *fluor albus* from two Latin words, *albus* and *fluo*, having precisely the same meaning as the Greek, namely, a *white discharge*. Hence, in popular language, the disease is called the "*whites*"; it is also called "*female weakness*."

These terms are well enough, perhaps, if we have in mind that they convey to us only the idea of a *symptom* of disease. They all mean, with the exception of the last, a white discharge from the female genital organs. They are slightly inaccurate, as the discharge is sometimes yellow, or green, or otherwise variant from white. Any discharge from the female genital organs which is *not bloody*, comes under the term "*whites*."

A Symptom Only.—As the name of a disease, the term whites has no specific meaning. It does not designate any particular complaint. It is a symptom, just as the matter expectorated and raised in lung diseases is a symptom; and as such only should it be regarded. When persons cough and *raise* a great deal, they do not, on consulting a physician, say they have got the expectoration; but they say they fear they have some disease of the lungs, because they expectorate. They look upon the expectoration as the *sign* or symptom of disease.

So females, and physicians too, must learn to look upon the *whites*, not as a disease, but as the *sign* or symptom of disease, which sign they should become skilled in interpreting.

There is no reason why the discharge from the genital organs should not be as well interpreted as the expectoration or discharge from the throat. The parts from which it comes may be about as easily and as well inspected.

No Female Ailments so Common.—There are no female troubles to which the attention of the physician is so often called as these annoying and debilitating symptoms called whites; and there is no department of medical practice in which the really able as well as conscientious and painstaking physician is so well tested. If, regarding these discharges as they are, simply as *signs*, he searches

faithfully for their cause, he will be led to a treatment which in a great majority of cases will be successful. And surely no success in life can be more prized by a right-minded physician. It procures health, the highest earthly boon, for suffering woman, and gratitude, the most prized of all rewards, for himself.

There are Four Kinds of Discharges from the female genital organs,—mucus, pus, mucus and pus combined, and the watery. The first, mucus, does not in itself imply disease; but when pus is discharged, we know that inflammation exists, because such a cause alone can produce it.

Seat of the Disease.—The cause which produces the whites may have its seat either in the vagina, or in the neck of the womb; and in practice it is of course quite important to know where its location is. The character of the discharge generally settles this point. If it be thin and watery, or thick and cream-like, it is from the vagina or passage which leads to the womb; if ropery, gluey or albuminous, like white of egg, it is from the cavity of the uterine neck.

Treatment.—Some physicians always prescribe the same remedy for the whites. They might as well have but one prescription for expectoration. The remedy must have reference to the *cause* of the discharge; until the cause be searched out, every prescription is a mere trial at guessing,—a sort of practice well enough adapted to quacks, but not becoming scientific men.

When a case of whites is brought before a physician who understands his business, he makes no prescription until he has discovered what the disease is. Having determined this point, his remedies have an intelligent bearing upon the case.

If the discharge be of a ropery, tenacious character, one of the best remedies is a strong solution of tincture of iodine, used as an injection with a female syringe, once a day (254). Of this, not more than two teaspoonfuls should be used at a time; and great care should be observed not to stain the underclothes with it. When the discharge is either yellow and thick, or lighter colored and watery, some one of the following: (200), (202), (203), (207), (209), (220), (230), (232), (243), (244), may be used with advantage as an injection, twice a day.

Some one of the above remedies will generally afford some relief; but if whites exist in a somewhat aggravated form, they furnish evidence of some serious disease in the vagina or neck of the womb, and the case ought to be submitted to a competent physician.

Absence of the Menses.—*Amenorrhœa.*

THE absence of the menses is divided into two kinds,—*retention* and *suppression*. It is retention when the monthly flow has never appeared; suppression, when, having been established, it is, by one cause or another, stopped.

Retention Explained.—The ovaries, as we have before said, are the centre of the female sexual system. It is the swelling or ripening of an ovum or egg, every four weeks, which causes the large flow of blood to the parts, and the consequent menstrual discharge.

But it sometimes happens that the ovaries are not developed at the usual time of life. The monthly evacuation does not then appear. There is retention. There may be retention, too, from other causes, after the ovaries are matured. Costiveness may sometimes occasion it; so may a degenerated and low state of the blood.

There may be *mechanical* causes of retention. The mouth of the womb may be entirely closed, or the neck may be so constricted as to close the passage through it, leaving no outlet for the monthly accumulation. The hymen, also, may have no opening through it. When these mechanical obstructions exist, there are sometimes large collections of fluid in the womb, which cause enlargement of the body, and in some instances, painful suspicions that the sufferer has committed imprudences, and is in the family way. Physicians should be on their guard against falling into such errors, and lending the sanction of their name to these blasting mistakes.

Suppression Explained.—Suppression—a stoppage after flow has been once established—may be caused by inflammation of the ovaries, the blood, in this diseased condition, being drawn so entirely to these swelling and germinating bodies, that the accustomed flow from the womb does not take place.

Inflammation in the neck of the womb may also cause a stoppage. So may a fright, as from a fire occurring in the neighborhood, or a cold taken by being caught in a shower. Girls sometimes, in their utter thoughtlessness or ignorance, dip their feet in cold water, when their courses are upon them, and bring on a suppression of a most dangerous character. The most lovely and innocent girls have done this for the purpose of attending a party; and, in some instances, the stoppage induced has ended in death within a few hours. The profound ignorance of their own mechanism, and of the laws which govern it, in which girls are kept who are just budding into life, is a serious reproach both to parents and physicians.

Suppression may be induced by whatever reduces the quantity or quality of the blood, as consumption, or by great depression of spirits. With some rare exceptions, women have not their turns while in the family way.

Treatment.—Before anything can be done in the way of treatment, the case must be thoroughly investigated, and the specific cause of the disease searched out.

If it prove to be *retention*, and arises from a bloodless condition and an undeveloped state of the ovaries, iron is the proper remedy (61), (73), (74), (75), with a generous diet and exercise out of doors. If caused by an inflammatory state of the uterine neck or ova-

ries, the proper treatment has been already indicated. If from costiveness, relief may generally be found from prescriptions (5), (9). The mechanical causes alluded to above, when found to exist, must be removed by gently dilating the mouth of the womb or the uterine neck, with bougies, beginning with the smallest, and increasing the size, or by puncturing the hymen, as the case may require. Permanganate of potash, in capsules of 2 grains each, after meals, is one of the best remedies.

Profuse Menstruation.—*Menorrhagia*.

MENSTRUATION may *continue too long*, or *occur too often*, or *be too profuse* while it lasts; or all these irregularities may be experienced by the same person. Any one of them will prove a serious irritation, and a drain upon the constitution; the whole together, if not arrested, will undermine and destroy it.

The Cause of this, like the source of all other female diseases, is, in a great majority of cases, overlooked.

It is not to be attributed, as so many suppose, to a congested state of the womb; but is rather the result, in a great many instances, of the inflammatory or ulcerated condition of the uterine neck.

In still another large number of cases, it arises from a succession of *ovarian abortions*. When the blood has run low, and nutrition is defective, as in the consumptive habit, the ovarian vesicles fail to reach maturity. Like other products of the economy, they become blighted, and abort. And as these blights occur often, nature is busy every two or three weeks casting them off. Hence, the menses appear often. They come and go without order, because they spring from a process which is a contraversion of nature's laws.

Profuse menstruation, like scanty menstruation, is a symptom of a variety of diseases. The quantity may be increased only on one or more days, or be so great as to cause death from hemorrhage. At all events, the amount of blood lost is often so great as to cause anæmia and impaired health for a long time. This is, however, usually the result of continued free bleeding extending through a number of months.

The local causes of uterine hemorrhage are fibroid tumor of the womb; inflammation of the womb, or metritis; inflammation of the lining membrane, or endometritis; uterine congestions from any source; cancer of the womb in its early stages; retroversion, or tipping over backward of the womb onto the rectum; polypus; enlargement of the womb following labor or abortion; the retention of placental tissue, etc., etc. These also are among the local causes of hemorrhage. But not infrequently the excess of flow is due to impaired general health. Wasting diseases like phthisis or consumption cause the blood to be so thin as to render it unable to form a clot, thus facilitating the easy or profuse hemorrhage often seen in young girls in the earlier stages of consumption; later, amenorrhœa ensues from utter lack of blood. This flowing often attends acute fevers, purpura, Bright's disease, jaundice, heart-disease and debility. This last cause is often seen in the case of young girls who have grown rapidly since puberty and pursued a vigorous course of study with little or no out-door exercise. The strain on the nervous system in these girls is kept up constantly by sharp competition, and no heed is paid to nature's demand for rest and relaxation at the menstrual time. The claims of society on the young girl add no small share in the production of this evil.

Explanation.—It is not easy to explain how inflammation and ulceration of the uterine neck should in one case produce suppression, and in another profuse menstruation. Yet it is a settled truth that such opposite results do come from one and the same apparent cause. Probably the explanation is to be found in the different degrees of inflammatory action, in the varieties of constitution, and in the variant degrees of tenacity with which the vessels hold the blood.

Bleeding from the female genital organs may be produced by a variety of causes which have nothing to do with menstruation. Such bleedings are properly *uterine or vaginal hemorrhages*, and not profuse menstruation. They are the result of inflammations, or tumors within the uterine neck (Fig. 140), or weakness. The womb may bleed for days, or even months, from pure debility.

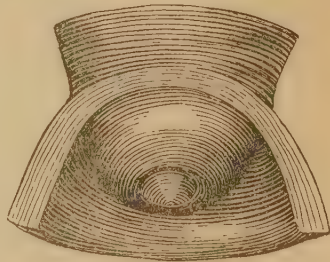


FIG. 140

Treatment.—As profuse menstruation and uterine hemorrhage spring from a variety of causes, so the remedies are various. Here again we are confronted with the same absolute necessity to investigate accurately the true nature of the complaint before we venture a single prescription. All the cases present one general feature. There is too great a loss of blood; and the first thought is that astringent medicines are necessary to arrest it. But if the bleeding be occasioned by a polypus, or by inflammatory ulceration, astringents would not arrest it, and might do great mischief.

When the immoderate flowing is caused by a general breakdown of the nutritive powers, and by ovarian abortions, the great aim must be to rally the vital powers by iron, quinine, porter, wine, a generous diet, exercise on horseback and on foot, and warm and cold bathing. When produced by local diseases of the ovaries and neck of the womb, the treatment is to be local,—such as has been described. If a polypus or other tumor be the cause, the remedy must be sought for under the appropriate head. If the womb has become relaxed, and bleeds from pure debility,—as it may,—something must be found, if possible, which will condense its substance, making it harder, smaller, and more solid. For this purpose, cold bathing, astringent injections into the front passage, and acid drinks are useful. But one of the best remedies is the wine of spurred rye (267). One teaspoonful should be taken three times a day. This article, by causing the womb to contract, solidifies and condenses it, thus arresting the blood which oozes from its relaxed tissues. Of course, the object of all treatment is twofold: the one to stop the hemorrhage for the time being, the other to remove the cause. The physician may have to be called, and resort had to tampons in the vagina; the uterus itself might have to be packed with gauze; hot douches of 115° to 120° F. will frequently quiet a stubborn hemorrhage, especially if rest in bed with the hips elevated be strictly enjoined. The hot douche should be repeated every three hours. Besides the giving of ergot, hydrastis, hamamelis and atropia are also quite useful, as, for instance: Fluid extract ergot, fluid extract hydrastis, fluid extract hamamelis, of each twenty drops, in water every three hours, with the addition of $\frac{1}{200}$ grain of atropia at the same time.

Sedatives, like the bromide of soda, in ten-grain doses every hour or two, will be of service if the hemorrhage be caused by fright, grief, or injury. The treatment of the intervals must depend on the cause, but generally some systemic tonics like iron or quinine are of great service; rest in bed is, par excellence, the treatment in most cases at some stage of the flowing, generally during the flow itself; but rest from excitement and freedom from overwork are equally important when the hemorrhage is due to this cause. Out-door exercise, fresh air and good food are none the less important for weary brains and tired nerves.

Hemorrhage between the periods, or menorrhagia.—When hemorrhage from the womb occurs between the periods, it is called *menorrhagia*, and is more apt to occur in women past thirty years of age, or, at all events, in married women. It is of more significance usually than profuse menstruation, and almost always proceeds from the womb itself. This bleeding comes on often after the *menopause*, or “change of life.” The causes are quite similar to those just considered, but local causes are oftener found. Some sloughing surface, as from cancer, fibroid, erosion of the lining membrane, exists in half the cases. Abortion, and the retention of small pieces of afterbirth, are frequent causes of this kind of flowing.

This trouble demands the immediate attention of the family physician or the specialist, who will examine the uterus and ascertain the cause; and, as not infrequently, the cause consists in something to be removed, a brief mention of the methods employed will not be out of place.

The size, shape, position and firmness of the uterus and ovaries are made out by the examining fingers of the left hand being pressed into the abdominal walls above the bladder, while the fingers of the right hand, with the knees drawn well up, are introduced into the vagina and pressed against the neck of the womb. An endeavor is then made to bring the womb between the two sets of fingers, which maps out its locality, position, etc. The ovaries and ligaments are likewise located. Any erosion of the mouth of the womb, foreign growth there, malposition, excessive size, etc., can thus be readily detected. To explore the inside, one of the various specula before described are used, and the uterus dilated either with tents, so-called, or more commonly with a steel dilator. If, then, there is found aught to be removed, a sharp, spoon-like instrument, called a *curette*, is used to scrape away all diseased tissue or foreign growth, and the womb then washed out with some antiseptic solution. The womb is then often packed with gauze to still further disinfect its interior and afford a means of draining away all oozing blood or forming mucus.

This operation called *curetting* is now frequently done as a regular means of treatment to do away with the causes of hemorrhage and to restore the normal bulk and character of the womb, instead of resorting to the slow, tedious, and less successful methods of former times. It is, to be sure, a regular operation; but when done under so-called aseptic methods, to be described later, is a perfectly safe and trustworthy treatment, far in advance of old-fashioned methods, which seem less heroic.

It necessitates rest in bed, nursing, and the disadvantages of sickness; but on the other hand, it saves lives, stops disease, and renders useful what otherwise might become useless and dangerous to life and health.

Painful Menstruation.—*Dysmenorrhœa*.

DYSMENORRHEA is from three Greek words *δυσ*, *μην* and *ῥέω* which

mean, literally, *a difficult monthly flow*. These words do not precisely describe the complaint; for it consists not so much in a *difficult*, as in a *painful* flow.

Symptoms.—This affection is always marked by more or less pain while the courses are on,—especially during the first day or two. The pain sometimes begins two or three days in advance of the evacuation. It extends over the whole lower part of the belly, running down, at times, to the thighs, and causing great distress in the back. It is frequently so violent as to resemble the pains of labor, compelling the sufferer to take the bed, and drawing from her tears and groans, and occasionally throwing her into spasms most painful to witness. So terrible are the monthly sufferings which some women experience from this cause, that the anticipation of it destroys much of their peace, even during the intervals of respite.

The Causes of this complaint are very numerous. There is, doubtless, such a thing as pain in the womb from rheumatism, and especially from neuralgia, though these are much rarer forms of the complaint than many suppose.

Pains at the monthly periods are often induced by a displacement of the womb. If the organ fall over backward or forward, its nerves are pressed upon in an unnatural way, and when the parts are crowded with blood, it is very natural for painful sensations to be excited. In these cases, the neck of the organ is bent at right angles, and the canal which passes through it is, of course, *strictured*, so that the evacuations are necessarily made with difficulty.

And this leads me to remark, that the passage through the uterine neck becomes, occasionally, from inflammation or other cause, almost closed. The result is, much difficulty and great pain in passing the monthly secretion.

There are no causes which excite painful menstruation more often than inflammation in the uterine neck and the ovaries. An increased flow of blood to an inflamed part always causes pain. An inflamed foot or leg has to be laid up in a chair, because it aches when put down. The reason is, that when hanging down it is more full of blood, and the sensitive nerves are painfully compressed. When the finger is hot with inflammation, *we assuage the pain by holding it up for the blood to run down*. For the same reason, the inflamed ovaries and uterine neck ache when the blood flows to them in large quantities, at the menstrual period.

Congestion of the lining membrane of the womb itself is a frequent cause of painful menses. *It is a condition of the membrane of the womb similar to that of the larynx in membranous croup*. There is the same pouring out of what physicians call coagulable lymph, which forms itself into a membrane. This membrane the womb strives by strenuous contraction to throw off, and finally succeeds in expelling it, not whole and entire, *but in shreds and patches*. These shreds, which women sometimes call *skinny substances*, are characteristic of

the disease. The efforts to expel them cause pains very much like those of natural labor, and sometimes almost as severe.

Treatment.—Painful menstruation, excited by the falling over of the womb, backward or forward, is cured, of course, by putting the organ back into its proper position.

Pains caused by stricture of the canal through the uterine neck, are cured only by enlarging the passage. This is effected by introducing at first a very small bougie, and then a larger and a larger, until the passage is of the usual size. It is a delicate operation, quite successful in careful and skillful hands, but liable to produce mischief when improperly conducted.

In all the forms of this disease, the treatment should aim, not merely at palliation, but at a cure. And generally, I am happy to say, a cure is attainable. Yet how many women suffer for years until health has fled, and life has become a burden, receiving from their medical attendant the assurance that palliation only is possible!

It is necessary at each monthly turn to do something, in these cases, to quiet the pain. For this purpose, twenty drops of spirits of ether in a wine glass of tepid water, thrown into the bowel, will be highly serviceable. For a like purpose, one pill (120) may be taken twice a day, beginning one day before the menstrual flow. A belladonna ointment (170) may be rubbed upon the neck of the womb with great advantage, and a teaspoonful of viburnum compound taken each hour.

In the congestive form of this disease,—*that in which the membrane is formed on the internal surface of the womb, and thrown off in fragments*,—the liquid acetate of ammonia, or spirits of Mindererus, is a very valuable remedy taken in two-teaspoonful doses, in a tablespoonful of cold water, three or four times a day, while the pain lasts.

Medicines almost innumerable have been put on the market for this complaint, of which Hayden's viburnum, liquor sedans, dioviburnum, and a host of others, are examples. These are usually harmless, and may be used. Gin, in goodly doses, is often serviceable by stimulating the circulation. Turpentine cloths, the hot-water bottle, rest in bed, etc., also help amazingly. But whatever remedy may be used at the time, even though the pain be severe enough to require an anodyne, the cause must be sought and treated.

Chlorosis.—*Green Sickness.*

BEFORE the age of puberty, the girl is only a child. She has within her only the *elements* of a woman. The *change* to which she is destined brings with it a wonderful development both of body and mind.

To effect this development, and bring out the new being in the perfection designed by the Creator, a large amount of hidden nerve-power is required. She requires to have been born with a well-vital-

ized constitution, and to have been physically trained in a way to harden and energize it. Without these antecedents, her development at puberty will be feebly and imperfectly made. Her development and *evolution of germs* will be so defective as to cause her menstruation to be only partially established, or to fail altogether.

Symptoms.—Where the inherent powers of the system are just sufficient to bring about a first menstruation, it often happens that they seem to be spent by the effort, and that the evacuation fails to appear again for several months. Indeed, the whole organization may break down at this point, and become blasted, as it were, like a blade of wheat which has grown well for a time, but which fails to develop the kernel.

The blood at this period may become impoverished, and fail to distribute adequate nourishment and development to the various tissues. When this occurs, it loses a part of its red globules, and increases its watery portion. As a result, the skin becomes pale, and sometimes of a yellowish hue; the bowels become torpid and confined; the nervous system sensitive and weak; the digestion is impaired; the appetite is either lost, or perverted,—longing for unnatural food; the tongue is white; the heart palpitates; the spirits are depressed; the temples and ears throb; the head occasionally aches and whirls with dizziness; the sleep is disturbed and abbreviated and hysterics are now and then superadded to close the catalogue of ills.

This is *Chlorosis*, briefly depicted in its origin and its symptoms. The word is from the Greek *χλωρός*, which means *green* and *pale*. By nurses it is called the “green sickness.”

Its Causes are quite numerous, among which may be reckoned impoverished diet, damp atmosphere, sedentary habits, long confinement indoors, overworking the mind in childhood, constipation of the bowels, and an inherited feeble constitution. This disease is very frequently met with in domestics emigrating to this country from Ireland, Sweden, and the Provinces, and depends on the failure of Nature to accustom herself to the new climate. These cases, however, all respond well to treatment, but when left alone, lapse into consumption, Bright’s and similar diseases.

Treatment.—Chlorosis, as a general thing, is connected either with retention or suppression of the menses; and in treating it, physicians are too much in the habit of resorting indiscriminately to forcing-medicines, called emmenagogues. From such practice great injury often results.

It is not always sufficiently considered that a woman fails to menstruate, or ceases to do so, *because she is sick*; and if we would cause her courses to return, *we must restore her health*. To do this, should generally be the great object of treatment. Let the health be restored, and the menses will come back. The only philosophical treatment is that which will invigorate the system.

In chlorosis, the vital powers are in a state of dilapidation. How can they be roused? By exercise on horseback and on foot; by wearing clothing enough to keep warm; by a tepid bath two or three times a week, and brisk rubbing with a coarse towel; and by a generous diet, composed of tender meats, animal broths, etc.

This treatment, however, should be preceded by unloading the bowels with prescription (35) or (40), according to choice. One pill should be taken at night. When the liver is considerably deranged, prescription (40) will be particularly serviceable. Half a pint of tepid water thrown into the bowel, night and morning, will help relieve costiveness.

The bowels having been well opened, give a tablespoonful of prescription (59), two or three times a day; or of prescription (60), a teaspoonful, the same number of times each day.

In the treatment of this disease, iron, in some form, is almost always needed. Prescriptions (61), (71), (73), (74), (75), (80) and (316), are suitable preparations. Among the more recent remedies for building up the blood in chlorosis, perhaps none is more successful than the combined pill of iron and manganese, called Bland's modified pill, or, if preferred in liquid form, the same remedy may be obtained in still milder and more physiological form in the preparation known as Gude's Peptomangan. The peptonate of iron is also one of the best modern remedies.

A girl suffering from this disease should always be taken out of school. The mind should be divided between rest and recreation.

Cessation of the Menses.—*Turn of Life.*

By *helping nature* and bearing in mind that the generative organs must be kept in health principally through the nutritive and nervous systems, by guarding against every cause which acts *unfavorably* upon either of these two systems, we shall do much to lessen the discomfort and danger of this period. Those who live well and exercise but little should change their mode of life; while it is equally true that those who are habitually overworked or underfed, should fortify themselves with more rest and a *fuller diet*.

Suffice it to say that except in those cases in which there is an established tendency to a certain disease, no woman who has led a normal, active life, and who has enjoyed a normal degree of health need fear to approach this period of her existence.

Nervous Complications.—It is the duty of the physician to look carefully after those females who come under his care at this critical time. For, in addition to the organic and malignant diseases which attack her at this time, she is exposed to a host of nervous irritations, which, if neglected or badly managed, make her life a cross and a burden. The symptoms of these irritations are in number, legion.

Age at which the turn of life comes.—As a general rule, the turn of life comes between the ages of forty and fifty; but occasionally occurs at other periods, varying from thirty to seventy. If the menses appear early in life, they terminate early.

Symptoms.—When there is a tendency to corpulency at this period, the symptoms are headache, dizziness, and a sense of suffocation. It is common, when the period of cessation approaches, for deviations from regularity to occur. At one time the menstrual discharge will be profuse; at another, scanty. It will now disappear for a time, and be replaced by the whites. Then it will appear for a few times with considerable regularity. Next will come a suspension for several months, to be followed by a flow of such profusion as to amount almost to flooding.

Mixed up with these irregularities will be palpitations of the heart, constipation of the bowels, a variable appetite, and broken sleep, weakness and inquietude, timidity, a dread of impending evil, irritability of temper, hysterical attacks, bad feelings in the head, with sounds in the ears, as of the rolling of carriages, sparks before the eyes, and an unsteady gait.

Treatment.—If there be, at this period, fulness of habit, with dizziness, headache, sparks before the eyes, a sense of suffocation, etc., there is a plain indication that the brain is oppressed with too much blood. Give at night three of the compound cathartic pills, and then keep the bowels regular with prescription (18),—a wine-glassful to be taken occasionally. The diet should be spare, and strictly vegetable: to which should be added much daily exercise.

For the flushes and sweats to which women are subject at this time of life, ergot often answers admirably, in teaspoonful doses every few hours. Atropia in $\frac{1}{100}$ grain doses not infrequently helps the sweating.

Purging should not in any case be carried too far.

The more simple remedies only should be resorted to for relieving distressing symptoms as they appear from time to time.

For keeping the bowels active a good formula is (18). The "hot flushes" or "dizziness" if not too severe are best controlled by foot-baths of hot mustard water. For the various "wandering" neuralgia pains apply a mustard plaster or paste.

Henbane is a valuable herb in disorders of the nervous system and may be used according to directions on pages 1015-6.

Or an infusion or tea made as follows: two teaspoonfuls of the powdered root of *Star-Grass*; one ounce of *Skullcap* (whole herb); one ounce of tops and leaves of *Catnip*; one-half ounce of *Valerian root*; one quart of water. Steep till quantity is reduced to one pint; strain, cool and take wineglass 3 or 4 times daily. This will be found an admirable remedy to soothe and strengthen the nervous system. In some cases it is necessary to resort to a rigid diet, excluding all red meat. A good tonic is (75).

Hysterics.—*Hysteria*.

THE name of this complaint is from a Greek word signifying the womb. It took this name from the belief that this organ is the seat of the irritation which produces the hysteric disturbance.

This belief is correct, if we include with the womb the ovaries and the other sexual organs. The sexual system is doubtless the centre of the reflex nervous derangement called hysteria.

It has been sufficiently demonstrated that hysterics are dependent for their existence either upon organic disease, or upon simple irritation of the sexual organs. Sir Benjamin Brodie mentions cases of the hysteric paroxysm, produced by pressing upon an inflamed and tender ovary.

Symptoms.—An attack of hysterics is generally preceded by depression of spirits, restlessness, and a frequent desire to pass water. It is sometimes marked by convulsions, or fits; at other times, it is not. At times, the attacks are local, and are manifested by spasms of the throat at the top of the windpipe, or in the bronchial tubes; *the patient feels a ball rise up in her throat* (globus hystericus), her heart beats violently, and she laughs and cries by turns.

When the disease is more general, the muscles of the limbs are thrown into spasms; the patient struggles violently; rising up in a sitting posture, and then throwing herself back; twisting the body from side to side, clenching the hands, and throwing the arms about, so that she is with difficulty held by persons much stronger than herself. Soon after these paroxysms, the patient generally passes a large quantity of very pale urine.

The Causes of this complaint are as numerous as the causes of female diseases, for in truth there is no female complaint which may not produce it. Whatever develops and excites the sexual system, and at the same time weakens the constitution, lays the foundation of this malady. Nervous women are much inclined to it. In large cities there is more of it than in the country, because there is more excitement and luxury, and more of their consequences,—nervous and female diseases.

Treatment.—To treat this complaint successfully, it is necessary to search out its cause, and remove that. Like the whites, it is not so much a disease in itself as a symptom.

The first inquiry to be made should have reference to the real origin of the complaint. Is it dependent upon inflammation of the ovaries or the womb, or to displacement of this latter organ? or does it arise from the low state of the blood, and the weakened condition of the nerves, acted upon by some irritation or heightened sensibility of the sexual organs?

If dependent upon inflammatory disease, that is to be treated according to directions elsewhere; if upon falling of the womb, no remedies will avail until that is put in its proper place. If diluted blood and weakened nerves be the cause, iron and quinine are the remedies. When the complaint arises from deficient menstruation, iron and aloes (47) will be serviceable. The nervous spasm can sometimes be broken up by pouring cold water upon the head, or face, or limbs of the patient.

The Hygienic and Moral Treatment are of great consequence. The complaint is very much under the control of the will. Whatever tones the moral nature and strengthens the will, tends to subject this disorder to the control of the patient. Plain, wholesome diet, exercise, bathing, and the enforcing, as far as possible, of a rugged, self-reliant habit, generally go far towards breaking its force.

Polypus of the Womb.

THIS is simply a foreign body, or tumor, growing either within the womb, or in the vagina, and attached to the uterine neck. It is rather a serious affection. SEE COLORED PLATE B, FIG. 3.

These tumors vary in weight from half an ounce and less to many pounds. They are, in color, whitish, red, brown, and even black. They have almost every consistence,—being soft, spongy, gristly, and hard.

The Symptoms of polypus are various, resembling those of almost every other womb-complaint. It is often mistaken for displacement of the womb, for dropsy of this organ, and for pregnancy.

These tumors are apt to give rise to dangerous bleeding from the womb, and other discharges which greatly weaken and derange the system. They are liable to terminate in cancer. In pregnancy, they may produce miscarriage. When they are suspected, therefore, the utmost scrutiny should be employed to search them out. This is especially desirable, since the fallen or inverted womb may carelessly be taken for a polypus, and be operated on as such.

Treatment.—This is of two kinds, medical and surgical. The first consists in means of supporting the strength of the patient, and checking the discharges by means of injections, rest, etc., and in endeavoring to cause the removal of the tumor by absorption.

This last object is sometimes effected by an unstimulating diet; and by the use of iodine (101) for some time. This treatment does not often succeed, however, and cannot be relied upon.

If the polypus be within the womb, of course it cannot be reached. The only thing to be done, in such case, is to cause its expulsion. This is sometimes effected by causing the womb to contract by the use of spurred rye (267), or by the use of the electro-magnetic machine. This latter remedy can do no harm, and had better be tried first.





When the polypus is outside the womb, the methods of removing it are various, the best being by a ligature, or tying a string around the neck of the tumor, and strangling it by preventing the blood from going to it. By this means it falls off in a few days. There is one other method, that of cutting the tumor away with a knife, or with a pair of curved scissors. These three last methods are the chief ones now used by skillful surgeons.

Uterine Hydatids.

THIS name is given to a bladder-like substance, occasionally found growing in the womb. It is filled with a white or yellowish fluid. Sometimes a bundle of them grow together, like a bunch of grapes. Some are elongated, like a bean, and have a sort of claw, by which they are attached; others are shaped like an egg.

Those with a claw are generally supposed to be living beings, like worms in the bowels. When expelled from the womb, they move about if placed in warm water.

The Causes which produce these singular growths are obscure. Probably whatever improperly excites or irritates the uterine organs may produce these vesicular bodies.

The Symptoms may be easily mistaken for those either of pregnancy, or of water or inflammation in the womb.

From the growth of these bodies, the bowels may enlarge, the breasts swell, and the menses stop. If to these symptoms be added sickness at the stomach, the woman, if married, feels confident she is in the family way. There is no certain method of correcting this mistake, until the collection of bladder-like bodies is expelled from the womb.

It is rare that these bodies appear in the virgin woman. They are supposed to be connected, in some way, with imperfect conception.

Treatment.—We can seldom say absolutely that hydatids exist, until we see them expelled. Whatever will produce contractions of the womb, will cause their expulsion; but it will not do to give these remedies indiscreetly, lest the cause be one of real pregnancy instead of hydatids. When once reasonably assured that hydatids do exist, the only logical treatment consists in their removal. This is best effected by the dilatation of the womb and a thorough curetting or scraping as described under hemorrhages. Ergot often causes sufficient contraction of the womb to drive out these masses, and may be judiciously tried before resorting to the curette. It should be given in teaspoonful doses every four hours till pains ensue.

Inflammation of the Womb.—*Metritis*.

THIS disease very often follows delivery, and is connected with child-bed fever.

Various Causes also produce it in the unimpregnated state. Inflammation of the ovaries, or of the uterine neck, may extend to the womb. Falling of the womb may cause it to be irritated by being placed in a new position, and thus bring on inflammation. In some temperaments, marriage may produce this disease; in others, singleness. It may also be brought on by painful menstruation, by forcing medicines, by constipation, by tight corsets, by solitary vices, and by excited sexual feeling.

This is the most common variety of inflammation found in the pelvis. It is often limited to the neck of the womb, and is then called *endocervicitis*; it may be limited to the lining membrane of the womb, and is then called *endometritis*, but practically it is all one and the same disease, and sooner or later involves not only the mucous membrane of the interior, but also the muscular structure of the womb itself. It is now considered a germ-disease and rarely results in spontaneous cure. It proceeds from the entrance of germs into the uterus either at the time of labor or miscarriage, or from the entrance of the germ of gonorrhœa; germs, however, from the vagina, which are normal to that region, may often be carried into the cervix and there set up a trouble. SEE COLORED PLATE A, FIG. 3.

Symptoms:—Pain in the back, nape of the neck, the right or left iliac region; leucorrhœa; painful menses; hemorrhage from the womb; systems from neighboring organs (bladder, rectum); and symptoms from distant organs, as stomach, heart, nerves, etc.

No disease gives rise to so many and so complex symptoms. Nausea and vomiting, flatulence, constipation, palpitation, headaches, cough, nervousness, loss of appetite, etc., are frequent symptoms of the various forms of metritis. On examination a hard, congested womb is felt, with perhaps enlargement either of the neck or the entire organ, erosions, ulcerations, eversion of the lips from a tear may be found, while issuing from the mouth of the womb is seen a plug of mucus which is either white, translucent and ropy, or yellow and more pus-like. The womb is tender to touch, and this tenderness may be transmitted to the appendages (tubes and ovaries).

Treatment.—This varies with the variety and the length of time the disease has existed. If there is inside the uterus any retained product of conception, placental tissue, or granulating surfaces, they must be curetted out as described in a previous article. This process is practically an operation and must be done thoroughly and under ether. If there is active inflammation going on in the tubes or ovaries, this procedure must be postponed and milder measures used for

the time being, such as painting the vagina and neck of the womb with iodine and similar remedies.

Tampons of wool wet with glycerine are frequently used to deplete the engorged womb, applications of creosote and iodine will often heal over simple erosions, while hard cicatricial masses are often absorbed by applications of iron. Tampons are to be worn from twelve to forty-eight hours, but should be removed whenever pain is produced. The womb is to be thoroughly scraped and washed out, and a good drainage kept for the escape of forming secretions whenever there is severe inflammation of the body of the organ. Lacerations of the neck, when extensive, are to be sewn up, but when only moderate may be successfully treated with strong styptic iron. Hot douches not only serve a good purpose in reducing congestion and inflammation, but are often very soothing. They are to be taken in the *recumbent* position; the water to be hot as can be borne—110° to 112° F.—and as much as six quarts are to be used. One should purchase for this purpose a large fountain syringe, or a tin pail, and hang it two feet above the head; it is to be used twice daily, and may be used every three or four hours. Patients suffering with this and similar diseases must not dance or take long walks, nor should they use the sewing-machine; neither should they stand long at a time, but should have light exercise in the open air and general systemic medicine; they should lie down every day from two to four hours, and in severe cases must retain the recumbent position. The bowels must be kept relaxed with cascara-sagrada or some morning saline; a teaspoonful of the aromatic cascara at night, or a half-glass of Hunyadi Janos water on rising, are excellent for this purpose. If the woman is pale, a prescription of some iron tonic will be useful, such as the *four chlorides* or *Aiken's tonic pill*.

Falling of the Womb.—*Prolapsus Uteri*.

THE womb is often found out of its natural and proper place. There are certain ligaments and muscles intended to act as stays, and hold it up in its position. These, from various causes, become *relaxed*. It then, losing its support, drops down into the vagina, between the bladder in front and the large bowel called the rectum, behind. It is then said to be *fallen* or *prolapsed*.

The womb of a married woman is more apt to become prolapsed than that of the unmarried, because it is more liable to have its weight increased by congestions, enlargement, torn perineum, etc.

The Symptoms are dull pain in the small of the back, a dragging sensation in the groin, and a feeling of fullness around the fundament; dragging pain in the nape of the neck; headache, constipation, etc.

Treatment.—The complaint is easily cured if the remedies be

applied early. If the prolapse be due to relaxed, weakened supports, tonic constitutional remedies must be employed. The diet must be full and easy of assimilation, exercise taken in the open air, proper rest secured, and electricity be used.

If the womb be tipped over, some support must for a while be used in the shape of pessaries. If by reason of its increased size and weight the womb hang too low down in the pelvic cavity, then it must be made smaller and lighter by treating the coexisting inflammation and subinvolution. If the floor of the vagina has been torn during labor, thus allowing the womb to sag, this must be sewn up and a new floor formed.

In complete prolapse of the aged, the uterus often protrudes from the vagina. This condition in the middle-aged is best met by amputation; while in the very aged a support may be adjusted after having replaced the organ.

Falling over of the Womb.

Anteversion.—The womb sometimes falls over *forward* upon the bladder, towards the pubes. This is called *anteversion*. The top is turned forward to the bladder; the mouth, back towards the large bowel. (Fig. 141, *b*.)

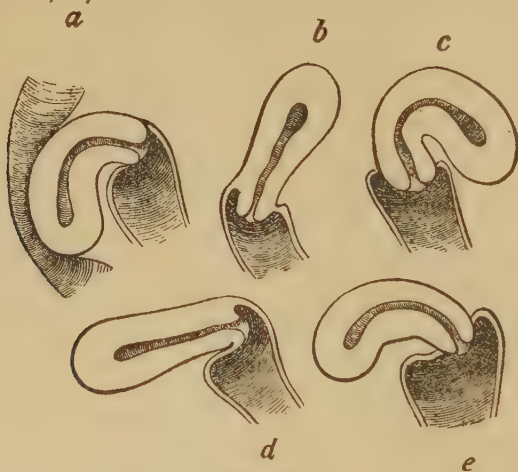


FIG 141.

Retroversion.—When the womb falls over *backward*, between the rectum and the vagina, it is said to be *retroverted* (*d*). This is just the opposite of being anteverted. In this displacement, the mouth is turned forward, the top backward.

This displacement may occur suddenly or gradually. If the former, there is generally great distress, and the organ should be immediately put back in its place; if the latter, the pain will be less intense, and the replacement must be effected by pessaries,—particularly with the ring pessary, made of India rubber.

How to Replace Fallen Womb.



Fig. 1

In many cases the Falling of the Womb can be replaced by taking the position in the above illustration.

Get on the knees, raising high the posterior, the chest touching the floor. Open the parts and allow the air to pass into the Vagina as far as possible.



Fig. 2.

If this is properly done the entire contents within the walls of the abdomen will at once drop forward as in figure 2.

There is a possibility that the womb has become so imbedded that for the first few times a gentle pressure with the finger upon the womb will be required to start it forward.

After the womb is thus replaced the patient should lie down with care so as to retain all the air possible in the Vagina. This will act as a support until morning.
Repeat this as often as necessary.

Anteflexion and Retroflexion.—When these occur, the womb is *doubled upon itself*, the mouth of the organ not being tilted up before or behind, but retaining its natural position. These flexions are represented by *a*, *c*, and *e*.

Besides these more common displacements of the womb, there are several slighter deviations which it is scarcely necessary to describe. There is the obliquity of the womb, which is simply a *leaning* of the organ backward or forward, or to one side.

There are still other more serious troubles, which are so very rare as not to require me to dwell upon them, such as the inversion of the womb, or turning it wrong side out, like the finger of a glove; and the hernia of the womb (hysterocele), which is like that of the bowel.

Pessaries.—Much might be said about pessaries: they are at times of the greatest assistance in keeping a badly placed uterus in its proper position; on the other hand, they are serious hindrances to health. By their pressure they often cause inflammation of the ovaries and tubes and light up afresh old, quiescent chronic inflammations. They often stretch unduly the uterine ligaments and make a relaxed vagina. But it must be said that often, too, they keep in place a simply misplaced womb with no trouble and little expense to the wearer, thus avoiding long treatment and perhaps an operation. They should always fit accurately and nicely and should never cause pain or make the wearer conscious that she wears such a thing. The soft rubber variety, or at least those made of wire and covered with rubber, are the least likely to cause trouble; but they need, on the other hand, more frequent inspection and cleansing. The hard rubber are more easily kept clean, but are more dangerous. Whenever a pessary is worn, it should be under the surveillance of the family doctor, lest ulceration of the vagina and undue pressure on the internal parts ensue. Pessaries no doubt are very useful in keeping in place a womb that has been replaced and in warding off an operation otherwise indicated. They are of all shapes and designs, so that a description of them seems superfluous here.

Displacements.—The various displacements of the womb are such common occurrences among womankind that they have always received considerable attention by the gynæcologist. They result from falls in young girls, from enlargement of the organ, from weak uterine supports and poor health, from torn muscles of the vagina during labor, and from new growths in the womb.

The symptoms of a misplaced womb are from nothing to an amazing amount of trouble. Many a woman goes through life with a badly torn vaginal floor and retroflexed womb without the slightest ill-effect, while her neighbor suffers intensely from a much less degree of displacement.

Operative Treatment.—When for any reason a pessary cannot or ought not to be worn, and there is much inconvenience from the misplacement, resort must be had to packing the vagina and reducing the size of the womb, and allaying inflammation and pain before again trying a pessary, or else some of the several operations must be performed. Of these latter there are at the present day three principal methods in vogue, viz.:—

Alexander's operation consists in cutting down on the little holes in the lower abdomen, near the pubic bones, called the hernial rings, through which in the male the cord and vessels of the testes run, where *hernia* or *rupture* occurs, and through which in the female the round ligament of the womb runs. This ligament is a small round cord attached to the anterior and top part of the uterus, acting as a stay. This ligament is dissected out and pulled up taut on either side (there are two, one on each side of the womb) till the womb is brought up into its normal position and there fastened. This operation is a very ingenious one, and answers well in simple uncomplicated cases.

Ventral Fixation is a second method of fastening the womb in place, and consists in opening the abdomen, lifting up the womb and fastening it to the under side of the abdominal wall. This method is tolerably free from danger, like the preceding, but has the advantage of parting adhesions which may bind down the uterus and prevent its rising, and of permitting the operator to see and correct any existing disease of the tubes and ovaries which so commonly accompany bad cases.

Vaginal Fixation is a third method, whereby the uterus is likewise fixed, but this time to the vagina in front of the bladder. This last method is at present receiving considerable attention; but it may be said that no one method is the best for all cases, the surgeon being the best judge of the situation. These operations are safe and efficient, and forever do away with pessaries and the existing disease. Women go on to term in labor quite generally after these operations.

Tumors of the Womb.

THE womb is especially prone to be the location of foreign growths. These occur mostly in middle life, and are commonly either of a fibroid or cancerous nature.

The *fibroid* is a firm, hard mass of fibrous tissue, growing either on the inside wall and suspended like a polypus, or developing in the uterine muscle itself, or on the outside of the womb in the abdominal cavity. They attain oftentimes huge proportions and weigh many pounds. They are not necessarily fatal to life or detrimental to health, but usually give rise to a train of symptoms which may be annoying and fatal. Hemorrhage and profuse menstruation to such an extent that the patient is rendered pale and almost blanched are

not infrequent. Pressure on the bladder and surrounding organs often causes serious disturbance to urination and defecation; digestion is interfered with, and pain is frequently present. When these tumors, which are of slow growth, are small, painless and free from trouble, they may be let alone; but when large, bleeding freely, and causing symptoms of pressure, they must be dealt with. Many gynecologists of the present day claim that every fibroid should be removed; but as this means the enucleation of the womb and ovaries (hysterectomy),—a very severe operation,—we cannot endorse this view, especially as hundreds of women go through life unscathed even with large tumors.

The *menopause*, or “change of life,” has a twofold effect on them: some begin to atrophy and grow small after the blood ceases to come to these parts in regular monthly congestion, and they may even disappear entirely: others are increased in size and even change their structure into malignant growths. Hence it will be seen that these tumors require the supervision of the family doctor or specialist, that their growth may be watched. It remains to be added that many advocate the use of strong galvanic currents, applied according to the method of Apostoli, a noted French savant, to diminish the size of these tumors. Many cures are claimed, and at one time it seemed as though this method was destined to supersede all others; but now, after a few years’ trial all over the world, it is generally conceded that only certain varieties are amenable to this treatment, and that the tumor does not entirely disappear. This method, however, obviates the necessity for operating, and is in many cases an admirable way of reducing and keeping in check what otherwise might threaten life. It is still a much used, though often abused, method of treating them, and appeals to the timid and obdurate.

Cancer of the Womb.

THIS is another but more dangerous growth of the womb, and occurs mostly in women near middle life, especially in cases which have a family predisposition to cancer, and when the neck of the womb has been badly lacerated from labor or miscarriage. It usually begins in the neck of the womb like a little bunch, which bleeds easily on touch, and extends rapidly into the neck and finally up into the body of the uterus. Its entire life-duration may not exceed one or two years before death claims the sufferer. Hemorrhage and foul leucorrhœa are often the only signs which attract the patient’s notice. Pain finally sets in, with breaking down of the cancerous tissues, and then a very foul and peculiar odor commences. This odor is very penetrating and is characteristic of the disease. Emaciation, loss of appetite and strength, painful days and nights supervene, and finally death comes to relieve the sufferer of one of the worst diseases to which womankind is liable. SEE COLORED PLATE A, FIG. 2.

Treatment.—The only treatment consists in the early detection of the disease and the enucleation of the entire uterus by the vagina. If it has been discovered early, before the cancer-cells have got outside of the womb, it may be successfully treated at least for a number of years. I can not better advise women than by warning them to consult a physician at once on the occurrence of any unusual hemorrhage near the change of life. So many ascribe these slight hemorrhages and aches to this broad mantle of ignorance, that precious time has been wasted and the golden opportunity passed for curing the dread disease. Do not waste time and money, either on nostrums or other quackish methods, nor listen to what Mrs. So-and-So did, but proceed at once to the best authority you have at your disposal. So much is being successfully done now for the relief and cure of these growths, women owe it to themselves and their families to take advantage of modern skill and knowledge. The microscope will detect it earlier than the eye or finger, and thus a suspicion may be corroborated or a fear dispelled by timely advice.

Of palliative treatment, the application of styptics and the curette cause a delay of the growth and a cessation of hemorrhage; while anodynes like morphine or opium in some of its forms will allay pain and anguish.

Ovarian Tumors.

OVARIAN tumors are rather frequent growths, occurring for the most part as cysts and attaining a huge size; not infrequently they grow to such an extent that their weight far exceeds that of the entire body. They are filled with a clear light-yellow fluid. Their treatment consists in their removal through the abdomen (ovariotomy), and should be operated upon as soon as detected. The rate of mortality following these growths is not large. It was this operation, began in America in the forties, that was the beginning of a new era for surgery of the abdomen. Only when neglected does one now-a-days meet with these enormous growths.

When for any reason an operation is inadvisable, they may be tapped and comfort received for a long time.

The ovary is likewise the seat of other growths both benign and malignant.

Inflammation of the Fallopian Tubes.

To speak of this disease means to review the growth of gynecological science within the last fifteen years.

The operation of laparotomy, or opening the abdomen, is now performed so successfully by almost every surgeon, that it has taken its place among the every-day measures for relief, and frequent opportunities have of course been presented to the profession, of corroborating or refuting some old-time theories. Many a notion of inflammation of the bowels, or peritonitis, has become a thing of the past;

many an unexplained death has been made clear, and many, many lives have been saved by a timely recognition of the true state of affairs within the pelvis.

Many cases of what formerly was regarded as peritonitis are now known to have been either salpingitis, ovarian abscess, appendicitis, etc. Of these diseases the most prolific of trouble, as well as the most common, is salpingitis, or inflammation of the tubes which conduct the ovum to the interior of the womb, where it is fructified by the male germ.

These tubes are lined with a mucous membrane like that of the interior of the womb, and continuous with it, so that whenever inflammation from whatever source is present in the cavity of the womb, it is extremely liable to travel up the tubes, even to the ovaries and peritoneum. This inflammation may be merely catarrhal, and only become bothersome by its chronicity, or it may become purulent and suddenly cause violent illness.

The *catarrhal* form begins very slowly and gradually from some old neglected uterine disorder, or it may follow a labor where there was some septicæmia or blood-poisoning; it may spring from venereal disease, either contracted by the woman illicitly or given her by her husband; and it may come in several ways not of general interest to the reader. At all events, it is essentially a germ-disease, and when anyways severe has a tendency to spread and become worse.

Symptoms.—These little tubes, which are normally about the size of a slate-pencil, become swollen, and very painful and tender, causing inability on the woman's part to do a full day's work, and even confining her to bed. The temperature is raised, the belly bloated, the urine often being frequently passed; the bowels are constipated, appetite poor, and digestion bad; sleep is disturbed and the nerves weakened.

On examination, the trained finger in the vagina feels a large, swollen, tender tube on the affected side, and often a bulging of the roof of the vagina.

Treatment.—Rest in bed, hot douches, painting the side with tincture of iodine, and the using in the vagina, every night and morning, of a suppository of five grains of ichthyol, with laxatives and nerve sedatives, will do much toward reducing a slight and even moderate attack. The disease, however, does not usually exist alone, and therefore much time is generally necessary in eradicating it.

When the catarrhal form, however, gets worse, and pus forms, we, then have the so-called *purulent salpingitis*, or *pus-tube*. Pus gathers here as elsewhere, stretching the tube more and more; finally the pus-germs work through the tube and out of the end, where they set up an active inflammation, and new tissue forms about the tube, shutting it off from the general cavity. Everything in the neighborhood becomes glued together, fixing the womb in an immovable

position. The tube goes on stretching more and more, till finally it becomes one large abscess-cavity. It may then, at times, be punctured through the vagina and thus drained; but generally an operation is required, either to remove the womb and its appendages through the vagina, or else to open the abdomen and take away the large mass of exudation, in the centre of which is the pus-cavity. When matters have reached this stage, the patient is of course in a very grave condition. There is a high fever, with sweats and perhaps chills, loss of appetite, pallor, pain, and all the evidences of being extremely sick. The patient either dies shortly or becomes bed-ridden, unless an operation can relieve her. This latter variety of the disease is called *pyosalpinx*.

Acute Salpingitis is best treated by rest in bed, douches, saline purgatives, and a liquid diet. It gradually subsides without serious results.

Chronic Salpingitis is the more common variety, is very protracted in its course, and rarely ends in spontaneous recovery. It requires great patience on the part of both physician and patient, and often can only be cured by the removal of the offending organ by laparotomy.

It must be remembered that all these various forms of tubal disease are produced by one form or another of bacteria or disease-germs, and that in their treatment strict cleansing of the vagina by antiseptics is necessary.

Salpingitis is always preceded by some form of metritis or endometritis, as, for instance, the gonorrhœal metritis, that caused by septicæmia or blood-poisoning, the metritis following labor, etc.

Inflammation of the Vagina.

THIS may be produced by many of the same causes which induce inflammation of the uterine neck. It may follow tedious child-bearing, especially if instruments have been used. Marriage is not an infrequent cause of it,—so may a pessary be, if an improper one.

The Symptoms are pain in the groins, a feeling of heat and tightness in the passage, and a difficulty in passing water. In a few days a discharge, like gum-water, begins to flow, which gradually becomes thicker, like cream, and is green or yellow. Sometimes the disease gets well in a few days; at other times it degenerates into the chronic forms, and lasts a long time. It should be cured as soon as possible, lest the inflammation cause the walls of the passage to grow together, and make a stricture, as in Fig. 142.

In this Figure, *b* represents the mouth of the womb; *a* is the lower entrance to a narrow passage in the vagina, called a stricture. It is caused by inflammation, which so thickens the walls of the vagina as to bring their inner surfaces near together. In examining a case of this sort, a practitioner needs to be on his guard lest he

mistake the entrance to the stricture, *a*, for the mouth of the womb, *b*,—a mistake which might lead to evil consequences as well as seriously damage his professional character.

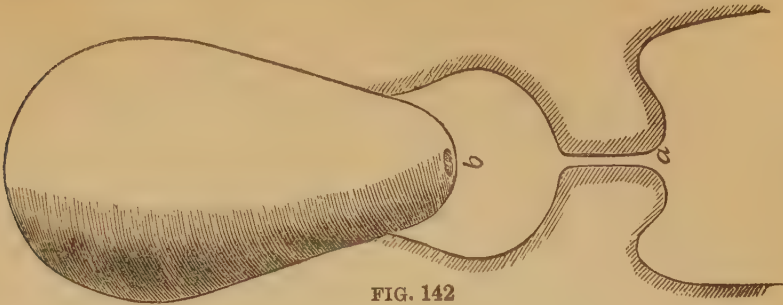


FIG. 142

Treatment.—The diet should be light and unirritating. The bowels should be kept open. A cooling wash (207), (218), should be used several times a day, until the discharge becomes thick; then employ injections (232), (202), (244), (243), of a more astringent nature. Let the marriage-bed be abandoned till the recovery is complete.

When the discharge arises from small granular elevations upon the inner surface of the vagina, the whole diseased surface should be painted over with a solution of nitrate of silver, two grains to the ounce of water,—the disease being brought to view by the use of a speculum. This may be done every other day.

Itching of the External Parts.—*Prurigo of the Vulva.*

THIS complaint is apt to attack females about the cessation of the menses, though they are liable to it at other periods. It is a most annoying and distressing affection. So terrible and tormenting at times is the itching of the external genitals, that the woman is unable to avoid rubbing and scratching, and she is occasionally compelled to absent herself from all society. She feels, as she says, as though she could tear herself to pieces.

Sometimes this irritation of the sexual organs excites venereal thoughts so dominant and controlling as to constitute a real mania, called *nymphomania*, from the name of a part involved.

This complaint generally indicates some disease of the womb, or its appendages, or of the bladder. When this is the case, of course it cannot be cured without seeking out and removing the disease of which it is a symptom.

Treatment.—To alleviate the local suffering, the lotion (223), or the ointment (171), may be applied to the parts several times a day. I prefer the lotion. A weak solution of nitrate of silver (211)

will sometimes do well. A four per-cent solution of cocaine is the best application.

When the disease is brought on by masturbation, as it sometimes is, this habit must, of course, be broken off before a cure can be effected. In this case, also, moderately cold water must be applied to the parts several times a day; some of the preparations of iron should be taken, and some active employment be engaged in, which will absorb the energies of mind and body.

Tubal Pregnancy.

TUBAL or ectopic pregnancy is mentioned here in connection with womb diseases, because it assumes the symptoms of certain uterine affections, and must be so treated.

When, for any reason, the ovum cannot pass through the Fallopian tube into the womb, where it is normally impregnated by the male germ, but is arrested in the tube, it not infrequently happens that the spermatozoon of the male travels upward through the womb into the Fallopian tube, and there meets the impeded ovum. Fecundation takes place, the ovum swells and grows, the tube stretches more and more till it bursts, and then a hemorrhage occurs into the abdominal cavity, from the leaking tube. A large clot of blood is formed, which generally arrests further hemorrhage and causes the death of the embryo, but not necessarily; after a time, another hemorrhage occurs, with pain, fainting, and even collapse, depending on the severity of the hemorrhage. If allowed to follow its natural course, the hemorrhage finally causes the patient's death. She dies suddenly, as if she were bleeding from a ruptured artery. The cause of all this mischief lies in the diseased tube in which the obstruction occurred. The Fallopian tubes are lined with a beautifully constructed mucous membrane: on the ends of the cells are small rod-like processes, which look (under the microscope) like a field of grain swaying with the wind; they move in one direction, from an erect position toward the uterus, and then relax and straighten up again to repeat the process; thus the ovum which has been grasped by the fimbriated ends of the tube from off the outside of the ovary (see Fig. 136) is carried down into the interior of the womb, where nature meant it should be impregnated. Now, when these tubes become diseased by catarrhal, and especially by purulent inflammation (see Salpingitis), the little rod-like extremities of the cells are destroyed, and the ovum finds no ready way of getting into the womb. An unusually active spermatazoon climbs up into the tube, because it has the power of motion so long as it lives; and thus the trouble begins.

Symptoms.—A woman misses her menstruation, and goes on a month; possibly missing a second or even a third menstruation, without many of the usual accompanying symptoms, till suddenly

she is seized with cramp-like pains in the lower bowel, and takes her bed; she may get up from this first shock of pain (due to hemorrhage), till a second, or even a third still severer attack ensues, when the doctor is called. If he is thoughtful, he at once examines and finds a bunch in the pelvis, on the side of the pain. This bunch is the clot, and the contained sac with the foetus. Not every case is taken alike, but many are crippled at the first onset of pain and hemorrhage; inflammation ensues, and sickness in bed attracts the attention. Usually, there is some slight hemorrhage of blood escaping through the tube into the womb and out into the vagina.

Treatment.—This disease, like appendicitis, belongs to modern surgery, as only recently has it been recognized, and treatment on a sound basis been formulated. Death is sure, unless surgical aid comes to the rescue. Laparotomy, or opening of the abdomen, must be performed at once, the clots washed out of the abdomen, of which, usually, there are a quart or more, the sac containing the embryo removed, and the tube tied off. The successes are brilliant, and lives are daily saved. The operation is a grave one, but not as much so as many others performed on the abdomen.

Sterility or Barrenness.

It has doubtless occurred to every person who has thought upon the subject, that there must be some special reasons why so many women do not and cannot bear children. These reasons I propose now to explain as simply and as plainly as the nature of the subject admits. To this explanation I shall add some remarks upon treatment; for, in nine cases out of ten, barrenness is completely curable.

Reproduction.—Throughout nature, life is perpetuated by reproduction. The vegetable and the animal die; but before death comes, they reproduce the *germ* of a new thing, or being, which lives after them. The law of reproduction, throughout the realm of nature, is one, and but one. All living things have male and female structures. Every new-being is evolved from an egg, the product of an antecedent parent.

Reproduction consists in the growth of an egg, or germ, in connection with some living part, until it is capable of independent existence. This germ or egg is the product of the female parent, and will abort or perish unless brought into connection with a fructifying element from the male. Thus, two palm-trees, growing about forty miles from each other, the one with stamens (the male organs), the other with pistils (the female organs), bore no seed for many years; but when they had risen in height above all intervening and obstructing objects, the winds bore the pollen from the stamens of one to the pistillate flowers of the other, which immediately began to produce fruit. A knowledge of this great law, as applicable to all living

things, enables horticulturists to raise such varieties of fruit as they wish, by shaking the blooming male branch, which has stamens, over the female flowers, supplied with pistils. Sometimes the male and female flowers are upon the same plant, at other times, upon different ones. The strawberry is of the latter kind,—the pollen being found only on the plants which have the largest flowers,—the pistillate flowers being only on the smaller plants. The pollen, or dust, is carried from the male to the female plant, on the feet of honey-bees, as they fly from flower to flower. It has been discovered that the reason why many beds are unfruitful (strawberry beds, I mean), is that the large male-plants are allowed to monopolize the beds to the exclusion of the smaller female plants. The plants with large flowers should be thinned out, leaving only a few to furnish pollen for the females, which are the real bearers.

A New Branch of Industry.—It is only comparatively recently that this law has been understood in its wide applicability. How wise and merciful an arrangement of Providence that an unseen hand should turn for man the mystic leaves of knowledge at the very time when he is most in need of the instruction imparted! At this very moment, the more complete knowledge of this great law is opening a new branch of industry, and a new supply of food, and is thus helping the solution of the great problem of how the increasing inhabitants of civilized countries are to be worked and fed. I refer to the propagation and culture of fish.

A committee appointed by the legislature of Massachusetts, reported very ably upon this subject. The eggs of the fish may be fecundated almost as easily as the pistillate flowers of the plant. It is only necessary, when the eggs of the female are mature, to hold her over a basin of water, and make gentle pressure upon the belly, when the eggs will pass freely into the water; then to pass the milt of the male into the same water, and shake them thoroughly together. By this means, the eggs are impregnated, and fish may be raised to any extent.

The egg of the higher animals is more difficult to fecundate, and that of the human female most difficult of all; for in nature, as in art, the more perfect structures are begun and reared with less ease.

Propriety of Imparting this Knowledge.—Men are naturally curious, and love to understand the mystery of their own origin; and yet there is scarcely any subject upon which they have so little reliable information. It has been held that this is a kind of information which it is not proper to impart to the multitude; the the curiosity which seeks this knowledge is based upon improper feelings; and that to gratify it by imparting what is sought, would lead to immorality.

I do not believe it. Such ideas are based upon a shallow philosophy. They overlook the fact that nothing excites the imagination

like that which is covered with mystery. It is *because* the immensely important subject of the procreation of the race is so carefully hidden from the public eye; *because* it is purposely buried so deep in obscurity, that any allusion to it excites improper thoughts. If the subject be properly viewed, it is no more indelicate to explain the mode of reproducing a human being than to explain that of propagating a plant or a fish. Both are effected in the same way, under precisely the same natural law.

True, the propagation of the human being involves moral laws likewise; but these relate only to the social relations in which it may take place, and do not affect in any way the propriety of making it understood by the people.

The Germ Furnished only at Certain Periods. — These general remarks bring me to the immediate subject in hand. Throughout animated nature, the female furnishes the mature germ or egg only at certain periods. The healthy human female, — as I have already explained, — matures a germ once in four weeks. These germs or eggs are constantly advancing, in succession, from the rudest beginning to a state of ripeness or maturity. Every person must have seen the eggs taken from a hen when killed in the laying season. Fig. 143 furnishes a good illustration. They are in all stages of progress, from the invisible germ up to the nearly mature egg.

Such is the progress of the human egg, — only that it does not attain to any such size. So far as the maturing is concerned, it occurs in the same gradual way.



FIG. 143.

Conception or Impregnation can take place only when a germ or egg is ripe; and as an egg ripens, bursts, and passes into the Fallopian tubes and thence to the womb only at the time of menstruation, it is plain that conception must happen somewhere in the neighborhood of this period. Intercourse with the male may take place at intermediate times; but, except in some rare instances, conception will not occur, because there is no mature egg to be impregnated.

Now, as every healthy woman brings to maturity a germ or egg at the time of every monthly flow, and as every ripened egg is capable, under favorable circumstances, of being fecundated, it follows that every woman who menstruates, and is well, can, under certain cir-

cumstances, be impregnated. To effect it, it is only necessary that the vivifying portion of the male semen, called spermatozoa, come into union with the ripened egg.

This union (for, that men and women may have a chance to know as much about themselves as they do about fishes and plants, I propose to make the whole subject plain) takes place in the following way. In the act of copulation, the male organ penetrates the vagina, and deposits the sperm, spermatic fluid, semen, or, as the scriptures call it, the "seed," directly at the mouth of the uterine neck. Some suppose that when the sensation of the female is at its height, the womb opens to receive the injected semen. But this is uncertain.

This spermatic fluid is composed, in large part, of mucus. A smaller portion of it is secreted by the testicles, and is the true semen, or life-giving principle. This last portion is composed, almost entirely, of fertilizing filaments or vesicles, which look like small animals (Fig. 144), and for a long time were supposed to be animalcules. They are generally called *spermatozoa*. By some mysterious law of their nature, they are endowed with the power of motion; and when deposited near the mouth of the womb, they immediately begin to move, as if by in-

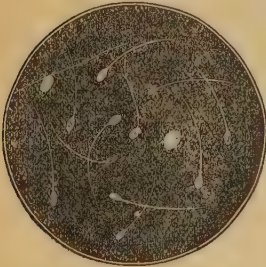


FIG. 144.

stinct, in search of a ripened egg. Passing through the uterine neck, they enter the womb. If an egg be found, in its ripened condition, they immediately embrace it, and, in some mysterious way, mingling their own contents with the contents of the egg, they impregnate or fertilize it. Fig. 145 shows the womb divided lengthwise. A, is the *internal mouth* (os internum), or point where the canal through the uterine neck enters the body of the womb; B, is the *external mouth* (os externum); the space between A and B, the passage through the neck; and C, C, the points where the Fallopian tubes begin. By looking back now, and examining Fig. 136, the whole thing will be understood.

This is a very brief and simple account of impregnation. It is supposed to be capable of taking place either a little before or a little after the monthly flow, and not at intermediate times, for the reason already stated.

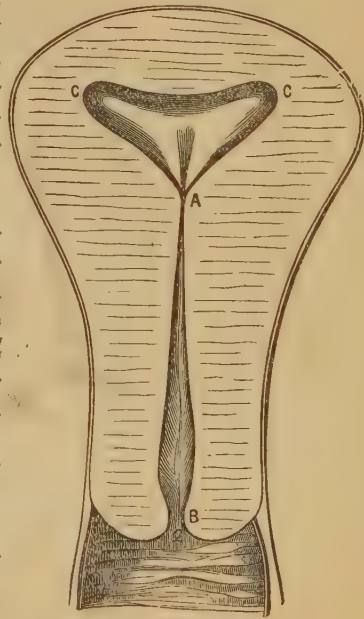


FIG. 145.

There are some reasons for believing that the same egg or germ, if fertilized just before the courses, will grow to be a male, while, if fecundated after the turns, it will be a female. One reason for this supposition is, that plants may be made to bear male or female flowers by simply subjecting them to different degrees of heat. If there be more heat than light, male flowers are produced; if more light than heat, female flowers are the result. The heat of the female generative organs is raised to its highest degree about the time the egg bursts its covering, which is just before the beginning of the flow.

It has been thought that the right ovary produces males, and the left ovary females; but this theory is not supported by any facts, and is probably not true.

Causes of Sterility.—From what has been said, it would appear that to ensure child-bearing it is only necessary that semen or seed, containing spermatozoa, come in contact with a germ-vesicle or egg, the right time; that there be no hindering disease; and that the parties cohabiting be adapted to each other.

It is evident enough that a want of adaptation between the parties, physical or moral, or both, is often an absolute bar to conception. A lack of moral adaptation was probably the obstacle in the case of Napoleon and Josephine,—her marriage with a previous husband, and his with a subsequent wife having both been fruitful.

It is certain that indifference on the part of the wife towards the husband, and especially repugnance, may prove an obstacle. A mere lack of sexual feeling does not necessarily prove a bar, though it probably lessens the chances of a fruitful union.

Conception may fail to take place from the diminutiveness of the male organ,—the semen not being deposited in the right place; or, from its excessive largeness,—penetration of the vagina being impossible. In some rare cases, the womb is absent. The inflammation of the ovaries often prevents the ripening of eggs. The Fallopian tubes occasionally get diseased and plugged up, so that no egg can pass to the womb. Inflammation in the cavity of the uterine neck is probably the most frequent of all the causes of sterility. The viscid, gluey matter which is secreted in inflammatory conditions of this part, plugs up the passage, so that no spermatozoa can pass up in search of the egg. The acrid discharges in most of the cases of whites destroy the fertilizing spermatozoa, and render conception impossible. All the displacements of the womb may act as bars to impregnation. If it fall over backward or forward, the mouth is tilted up before, or down behind, and is not in the right position to receive the semen. One of the most general causes is trying to avoid pregnancy in early years of married life.

Treatment.—Judicious treatment will, in most cases, remove sterility, and open that “well-spring of pleasure,” which the poet has so felicitously described as—“a baby in the house.”

The obstacles to conception, stated above, are chiefly those diseases which have been previously described. To cure those diseases is to remove the obstacles. When it is dependent on the causes which produce painful menstruation, or profuse menstruation, or a suppression of menstruation, the remedies are the same as are pointed out for those complaints. If inflammation of the ovaries be the cause, a cure may be effected, provided the inflamed condition be removed before the bundle of eggs be destroyed. If inflammation or ulceration of the neck of the womb be the obstacle, the remedy may be found in the treatment recommended for those affections.

Sterility depending on the causes just mentioned, I have had the pleasure of curing many times. When dependent on a lack of physical or moral adaptation between the parties, it does not, of course, admit of relief. It is a misfortune to be borne in silence. It has happened, perhaps, through a lack of judgment or care in selecting a partner, and is one of the mistakes of a lifetime which a lifetime cannot repair. When this want of adaptation is not complete, a remedy may frequently be found.

Unfortunately, many females do not regard sterility as an evil to be deplored, but rather as a blessing to be desired. Life, to them, has no high aims or duties,—it is a round of fashion and pleasure. To bear and rear children interrupts their frivolities, and they seek to escape such abridgement of their pleasures. This is wrong. Life is a great theatre, in which all should strive to act some worthy part, and feel that, upon retiring, it would be wrong to leave their garments upon the vacant stage, with none to put them on, and continue the drama.

Midwifery.

A STOPPAGE of her courses is most commonly the first notice a woman has of her being in the family way. This is perceived about three weeks after conception, when she begins to experience other feelings peculiar to the situation. These feelings are *nausea* and *vomiting*, or a decided languor, in the morning; swelled and sometimes painful breasts; the areolæ, or colored rings around the nipples, *darker* than usual; pain in the lower part of the back; and, occasionally, a good deal of spitting of a frothy, cotton-like substance.

These symptoms are more or less severe in different cases, and under different circumstances, according to the state of the patient's bowels and her habits of exercise. Ordinarily, she suffers most during the second and third months, on account of

Sinking Down of the Womb, which, from soon after the period of conception, is gradually increasing in size and weight. As it grows larger and heavier, it sinks lower in the cavity of the pelvis, until about the fourth month, when, becoming so large that it cannot longer be accommodated within the narrow limits of this unyielding *box of*

bones, it is obliged to mount higher to find room in the ampler and more distensible belly. This low position of the womb in the early months of pregnancy occasions many disagreeable sensations,—as pain in the lower part of the back and sickness at the stomach.

The Costiveness, too, from which women suffer so much at this time, is often caused, in part at least, by the pressure of the enlarged womb upon the lower bowel. Costiveness, thus induced, at length becomes itself a cause of serious mischief. The lower bowel, filled and enlarged with its hardened contents, reacts upon the womb, crowding it still lower in its narrow quarters, and greatly increasing its excitability. The enlarged bowel and womb combined make constant pressure, *sometimes* upon the urethra, or water-pipe, causing pain and difficulty in making water, and *always* upon the ascending veins, checking the return of blood, and producing congestion in the lower bowel, manifested by troublesome *piles*.

Treatment of Pregnancy.—When the pregnant woman first recognizes her situation, she should determine to “observe moderation in all things.” Let her avoid violent and sudden exertion, and move about more calmly and evenly than usual. By this is not meant that she should give up her customary occupation; but that she should pursue it with becoming carefulness, resolved in no case to hazard over-exertion, and rather leaning to the side of indolence. This would not be *real indolence*, for she is doing a *great work internally*, and should not unduly withdraw her energies to external affairs.

Let her not be too much in the erect position. If of delicate constitution, and not in vigorous health, she should make it a point to lie down several times during the day. The standing position, continued for a long time, especially if it be under circumstances to induce fatigue, greatly favors the descent of the womb,—while a frequent rest in a horizontal position may enable it to keep its place.

An Objection.—It may be objected by some, that a large majority of the mothers in the world are working women, and obliged to contribute by their industry to the support of their families; and that they cannot afford, therefore, to lie still, and mind directions.

To this it may be answered, that it is a great advantage to understand the best way, so as to have the privilege of at least aiming at it. Much is accomplished, in all circumstances, by aiming at doing the best thing; and few women are so situated that they could not so favor themselves as to obey the laws of health a little more perfectly, if they thoroughly understood them. All can better afford to avoid sickness, than to be sick. Many occupations, also, unless money tempt to excessive application, become, when steadily followed, comparatively easy and unexciting. Thus, most people can go through their usual round of duties, because they have *got used to it*. Indeed, there is nothing but indolence itself, to which we may

not become accustomed. The difference between the laboring and the privileged classes is more imaginary than real. All must work. None can escape the primeval decree—"In the sweat of thy face shalt thou eat bread."

Many women, when they find themselves in the family way, will observe no caution, but work all the harder, and even use other means for the purpose of bringing on abortion, and preventing an increase of children. This unnatural and wicked, but too prevalent, disposition, results sometimes from a fear of the pains of child-birth, sometimes from a desire to avoid the necessary care and confinement connected with raising children, but most often from a wish to escape the expenses which the prevailing fashions and customs of society connect with a large family. The cost of a shattered nervous system, and of a body weakened and poisoned by powerful drugs, is not considered, because not understood! Hence the success of those quack advertisements, impudently professing to cure female diseases, but whose chief object is disclosed by the insertion of the hypocritical caution—"Be careful not to take this medicine during pregnancy, as *it will be sure to produce abortion.*"

It seems as if the world would never learn that God loves children, although since Abraham's day he has said so much about them in his Word, although His Son, sent into the world on purpose to show the disposition of the Father, took them up in his arms, and blessed them, and although He has implanted a most wonderful love of them in the soul of man.

Costiveness and Piles.—Let the pregnant woman use all proper means to keep her bowels in order. She will thus greatly diminish the distressing nausea, and may entirely prevent the accession of piles. To accomplish this object, the saline aperients (7), (5), or, occasionally, other mild cathartics (10), (12), (14), may be used. But more important than either or all of these is the frequent use of a good self-injecting family syringe. An injection of half a pint of cold water every morning will do much towards regulating the bowels, and preventing or curing piles.

Nausea.—If, as sometimes happens, there should be persistent nausea after the first three months, it will need to be combated by mild tonics and stimulants, as chamomile tea, or clove tea (58), (114), and by seeking a kind of diet which will be agreeable both to the palate and the stomach. Ten grains of ingluvin after each meal, and on arising, oftentimes prevent vomiting. Stretching the neck of the womb moderately, and replacing a retroverted womb, are foremost in importance of treatment when structural causes demand such interference.

A tablet containing 2 grains of oxalate of cerium, 2 grains of subnitrate of bismuth, and 1-12 of a grain of cocaine is very useful if taken three or four times a day. These tablets may be bought under the title of nausea tablets if made by a reliable chemist.

The Nipples. — During the last month, particular attention should be paid to the nipples. Untold misery often results to the young mother from *sore nipples*; and it is well worth her while to use every precaution against them. The nipples are, of course, in an excitable state during the whole period of gestation, and at length frequently become irritable and tender. Let them be daily bathed, for three or four weeks before confinement, with some astringent and cooling lotion, as oak-bark decoction, borax water, alum-water, or a solution of tannin (200), (201), (202), (203).

Nothing is better than the daily application of weak alcohol and water.

The object of treatment, in this case, is to toughen them and render them less susceptible, so that they may not be made tender by the subsequent application of the child's lips.

When a woman is peculiarly liable to this trouble, the further precaution of having them gently drawn by some friend, every day, during this last month, would be of great service.

At all events, let no pains be spared to guard against this evil; for sore nipples make sore breasts, and sore breasts make broken breasts; and broken breasts are terrible things. They make the mother sick; and if the mother is sick, the child is sure to be sick; and all hands soon get sick and worried, and the whole business of having children, and taking care of them, is deprived of its peculiar joys and consolations, and brought into undeserved disrepute. Whereas, under wise and prudent management, there is something delightful to the young mother in yielding sustenance to her dependent offspring. For, when her nipples and breasts are in a healthy state, she can say with the poet, as

“The starting beverage meets its thirsty lip,
'Tis joy to yield it, as 't is joy to sip.”

Swathing. — In advanced pregnancy, much assistance in supporting the burden is sometimes derived from swathing the bowels. Healthy and vigorous women, however, need no such assistance; it is chiefly applicable to cases of debility, either constitutional, or resulting from neglect, or from over-exertion during former pregnancies.

Cramp in the Stomach is sometimes very severe, and if allowed to continue, may kill the child. The best remedies are warm carminatives (114), (115), or anodynes, etc. (121), (122), or antispasmodics (90), (94).

Headaches. — These may be relieved by antispasmodics, etc. (90), (94), or anodynes (121).

Palpitation of the Heart may prove very distressing to delicate women. The remedies are the antispasmodics, with rest. Sometimes tonics are useful, such as the muriated tincture of iron (73). The bowels should be carefully regulated.

Fainting, which occurs before or at the time of quickening, is sometimes very troublesome. The proper treatment is the avoidance of fatigue, and, during the fainting fit, the recumbent posture, cool air, application of cold water to the face, and ammonia to the nose.

Cough is sometimes present. It is caused by the upward pressure of the diaphragm against the lungs, by which they are irritated and convulsed. The remedies may be selected from the cough preparations among the prescriptions.

Heartburn may be relieved by 10 gr. doses of bicarbonate of soda taken in water after meals. Ten grains will be equal in amount to that quantity which may be scooped up on a five-cent piece.

Varicose Veins. — These cannot be removed during pregnancy; but they may be relieved by great care of the bowels, and by wearing tight bandages, or elastic stockings.

Swelling of Lower Limbs is caused by pressure of the enlarged womb upon the veins; and may be relieved by care of the bowels, and diuretics (130).

Itching of the Genitals may be much relieved by borax, camphor, etc. A four-per-cent solution of cocaine, painted on, gives most relief, and is most curative.

Miscarriage. — *Abortion.*

WHEN a woman in the family way throws off the contents of her womb, or loses her child, during the first six months, the accident is a miscarriage, or abortion; when the same thing happens during the last three months of her term, it is a premature labor.

Symptoms. — If abortion occur during the first month after conception, the symptoms may not attract much attention or, may be regarded only as an irregularity of menstruation. Occurring at later periods, it is frequently indicated by some feverishness, coldness of the feet and legs, a puffed-up condition of the eye-lids with purplish discolorations, shooting pains in the breasts, which become soft, pains in the back, bearing-down pains in the lower part of the bowels, which come and go, and at length take the character of real labor pains. As these pains increase, blood begins to appear, and, sooner or later, the bag of water breaks, and the foetus is thrown off.

Causes. — These are very numerous. Some of the principal are, displacement of the womb; ulceration of its neck; syphilitic disease of the foetus received from the parent; too much exercise; heavy lifting; falls, particularly when the woman comes down upon the feet, and is heavily jarred; emetics; powerful purges; and too much nuptial indulgence.

Treatment.—Where the symptoms are but slight, nothing may be required more than a little caution for a few days, and rest in the horizontal posture.

Neither very hot nor cold drinks should be used, the bowels should be made quiet, liquid diet should be given, and if restless or in much pain, 8 to 10 drops of laudanum in water may be given every two or three hours for five or six doses, care being taken that at the first onset of sleepiness the medicine is stopped. Should pain persist and flowing accompany it, the chances of preventing the abortion are poor, in which case take either linen or absorbent cotton or a strip of gauze, (any of them must be sterilized) and introduce into the vagina with as much pressure as can be used. This will usually stop the flow, though in many cases it will not prevent the abortion but will allow time to call a physician who will be needed in such cases. As blood-poisoning causes such a large per cent. of deaths all precautions as advised under the chapter on antiseptic surgery should be followed.

If the abortion cannot be prevented,—especially in the latter months of gestation,—then the case is to be permitted to go on, and to be treated the same as a natural labor.

Abortion (*Criminal*).

MANY married people who consider the bearing of children a burden, and those who suffer from a lapse of virtue, are tempted to commit abortion.

I wish it were possible for me to express to them the sin and folly of such a course. The sufferings and evils that almost always follow are far worse than any care or shame which come from letting nature take its course. Any crime against nature is sure to be punished. In this case, consumption, nervous prostration, and various womb complaints are the usual accompaniments, ruining the future life or usefulness of the woman, until finally life becomes a burden to herself and friends; it usually being impossible to obtain a cure, though she seek it carefully and with tears. No conscientious physician will commit abortion. She will be obliged to trust herself in the hands of quacks and rascals, who commit the crime either with medicine or instruments, in one case ruining the digestion, in the other the womb. Nature has not provided any way in which it can be done with safety, and it is justifiable in no case except when it will save the life of the mother.

Prevention of Pregnancy.

THERE are many cases in which, on account of some contagious or hereditary disease, it is not advisable for the wife to become pregnant. It is not always advisable for a wife to have children too fast, the constitution not being strong enough to stand the strain of bearing children, or the care of bringing them up. In such cases, while

it would be wrong to commit abortion, it would be desirable to avoid pregnancy. I do not agree with many of the fashionable women of this age who consider the bearing of children a burden, and who do not know the joy of a baby in the house. How little they realize that the happiness and pleasure of a family of children is far greater than the care; that love makes labor light. It is hard for the young to realize the lonesomeness of childless old age.

While it may not be best to have children too fast when young, they must realize that if protective measures are carried on too long it will be impossible for the woman to become pregnant. Nature has provided a reasonable way; if there is no coition for ten days after the courses, or three days before, the chances of pregnancy are much diminished.

How to use the Douche or Vaginal Injection.

Every woman should make it her habit to take a warm water douche once every twenty-four hours, except during her courses, to insure health of the parts. The reason for this is obvious when thought out seriously—for secretions (often poisonous) which are allowed to remain within the parts often cause inflammation and other more serious trouble.

The best way to use the vaginal injection is to procure a fountain syringe, which consists of a rubber bag and long tube, on the end of which can be attached hard rubber nozzles of convenient size.

First fill the bag (which should hold at least two quarts) with warm water or other solution to be used. Hang it on a nail, placing the douche pan on the bed or floor. The douche pan should be capable of holding at least one gallon. Then lie down, placing the pan under you in such a position that the buttocks rest on top of the pan, in order that the solution after leaving the vagina will run into the pan without splashing over.

A more simple way, *but not so effective*, is to sit on the toilet, insert-
ing the tube into the vagina.

CHILDBIRTH
OR
LABOR.

What to do in case a Birth Occurs in the Absence of a Physician.

IN an emergency or until a doctor comes the midwife or attendant should know the nature of the presentation of the baby.

If the head presents itself and the birth be difficult on account of the failure of the shoulders to pass, the forefinger may be inserted to release the shoulder, and gentle pulling exerted. This assistance should overcome the difficulty.

The Naval Cord.—Place the child away from the mother's discharges, and see that the Naval Cord does not interfere with its breathing, and remove the mucus from the mouth and eyes. As soon as the child shows signs of life by breathing and crying (and not before), tie a strong string tightly around the Naval Cord, about two inches from the child's belly and see that the knot is tight and secure. Do the same some four inches from the belly. Then cut the Cord between the *two tyings*.

Afterbirth.—Give time for the natural expulsion of the afterbirth (placenta). If the womb does not expel the afterbirth promptly, a gentle pressure of the hand on the abdomen in the region of the womb will do so. When the afterbirth has been expelled a broad bandage should be wound around the abdomen as a prevention from hemorrhage and should be worn several weeks.

Necessity for Rest.—Do not allow the mother to move her position or exert herself in any way for several hours, for perfect quiet will reduce the chances of flooding. After a quiet rest, and not before, a cup of warm broth may be given and the sheets of the bed changed, if necessary, but they must be thoroughly dry and warm, otherwise the mother is liable to receive a chill which would prove serious.

The Infant.—In the meantime the infant should have been well greased all over with olive oil and most important of all the baby's eyes must be thoroughly washed with a weak solution of Boracic Acid and warm water (otherwise blindness might occur) and then dressed. After the child is dressed it should be placed at the mother's breast for nourishment and to encourage the flow of milk. Should the doctor arrive he would then look to their further welfare. On the second day the child should be thoroughly bathed in warm water.

Childbirth or Labor.—*Delivery.*

The expulsion, at full term, of the child, the after-birth, the membranes, and the fluids, constitutes labor, or delivery. It is supposed to occur about two hundred and eighty days after the last menstruation; but authors reckon it differently; in truth, it is not possible to fix it exactly, for it evidently varies in different cases.

When the time of her lying-in arrives, let every woman meet it with calmness and undoubting confidence. There is every reason to encourage this state of mind.

Let her resist the temptation to a feeling of haste. Nature will often proceed more evenly and more speedily if allowed to take her own time. A hurry to get through is a great obstacle to successful delivery; it always puts things back.

Symptoms:—One of the first indications that labor is about to begin is, that the woman finds herself *smaller*,—the child having sunk down lower in the abdomen, and she accordingly breathes easier. The genital organs become relaxed and moist, and mucus escapes, which is called “the shows.” The woman finds herself disposed to be nervous and fidgety, and perhaps a little depressed in spirits.

When labor has fully set in, it is marked by lowness of spirits, flashes of heat and cold, a great desire to empty the bowels and to make water, and grinding, cutting pains, which grow stronger and more continuous, with intervals of ten or fifteen minutes’ ease between. Vomiting in the early stages of labor often occurs, and may be regarded as favorable,—indicating the softening and opening of the mouth of the womb.

Treatment of Labor.—When labor begins, the attention should be directed to the state of the bowels and bladder. The child’s head begins early to press upon the bladder and lower bowel, causing the desire to make water, etc.; and these should be immediately emptied to make room for the head to pass more easily. The bowel may be freed by a dose of castor-oil (10), if there is time for it to operate,—but more surely, and more satisfactorily, by an injection. Relief in the bladder may, perhaps, be obtained by a different position of the woman in the act of making water. It is the pressure of the child’s head upon the water-pipe which causes the trouble; and to relieve it, the woman should get upon her hands and knees, with her shoulders lower than the hips, so as to throw the child upward and forward towards the cavity of the abdomen. Thus situated, she may often

find it easy to make water, when in the ordinary position it would be impossible. If, however, this manœuvre does not succeed, and the bladder becomes greatly distended, the catheter must be used.

The Bed and Habiliments.—In the next place, fix the bed and the patient's habiliments. Reject feather beds; use the mattress. Cover this with a rubber cloth, if convenient, and then with folded sheets to absorb the discharges, and protect the bed. Let the woman be arrayed in the same garments she expects to wear after the completion of the labor, and let these be well tucked up under her arms, and let the lower portion of her body, from the waist downwards, be enveloped in a sheet. This sheet can be easily removed, and the clean clothes pulled down without greatly disturbing the patient when in the exhausted state which follows labor, and when it would subject her to great fatigue to be obliged to sit up in bed to have her clothes changed. Let her lie upon her left side, with her body shortened by bending forward, so that the muscles may be relaxed; let her head be placed in the middle of the bed, and her feet press against the right foot-post. Around this post a shawl or towel may be fastened, upon which she may be allowed to pull during the pains.

Antiseptic Dressings.

IN one essential particular, the case of the modern woman differs widely from that of our grandmothers. Childbed-fever, blood-poisoning, and other similar germ-diseases, have been from time immemorial the *bête noire* of the lying-in chamber, and the odium of the medical profession. Since the discovery by Sir Joseph Lister, of England, that these diseases were caused by the introduction of germ bacilli into the living tissue, and that to prevent them it is only necessary to kill these germs on all things which in any way come in contact with the mother's private parts, these diseases have become very much less frequent in occurrence, and much less fatal. We know now that the skin and vagina even normally contain living germs which act as scavengers of dirt, and exert a beneficial influence on health, so long as they remain in their natural abodes; let them, however, be introduced into the system through raw surfaces, tears and excoriations consequent on labor, and the group of symptoms generated by this poison is truly frightful to think of.

To avert such catastrophes, it must be the aim of the physician and nurse, and even the patient, to use scrupulous care in keeping away from the patient anything which has not first been rendered absolutely clean or germ-free.

It thus becomes evident that, first of all, as soon as labor sets in, the thighs and privates should be thoroughly washed with soap and some antiseptic, as, for instance, a five per-cent solution of carbolic-acid, or better, sulpho-naphthol solution, which may be made by adding one-half teaspoonful of sulpho-naphthol, or "oil of milk," to a quart of

water; better still is a solution of corrosive sublimate of the strength of one part in two or three thousand parts of water. This poisonous drug is best bought in tablet form, so that by adding one tablet to two quarts of water, we have the required solution. During labor, and even after, all napkins and cloths used to protect or wipe the woman, must be wet in one of these solutions, or otherwise disinfected. Every examination by the physician or nurse must be made only after thoroughly scrubbing of the hands with soap and some disinfectant. The napkins used may either be wrung out of these solutions, or steamed an hour before using.

By such precautions we may expect to avoid blood-poisoning. The nurse must always wash and disinfect her hands before giving a douche or handling the patient's private parts. The douche is always a source of vexation to nurses, and the matter may here be thus stated: unless there has been given an order by the physician to the contrary, never use a douche after the baby is born.

Remember the principle of always keeping surgically clean, i. e. *germ-free*, all objects which come in contact with the lying-in woman.

The Presentation.—An examination with the finger is to be made to learn the presentation,—that is, to learn which part of the child comes first into the mouth of the womb.

Head Presentation.—If the head present, the labor will probably go on without the need of medical aid. But in all labors there is a liability to dangers from unforeseen accidents, which renders the attendance of an intelligent physician highly prudential.

Breech or Feet Presentation.—If the feet or breech present, it is desirable to have the first part of the labor proceed slowly, so that the passage may become well dilated, and prepared for a more rapid delivery of the head. If the breech present, do not pull down the feet; let the child come double; it will make more room for the head. If the feet present, let there be no pulling upon them to hasten the birth of the breech.

After the feet and breech have fully cleared the external orifice, the delivery may be judiciously hastened for the purpose of preventing the death of the child from pressure on the umbilical cord, before its head is brought to the air, and the act of breathing thus permitted. For after the pulsations of the cord cease, the child must either breathe or die.

In this kind of presentation, therefore, the child's life is in great danger. After the birth of the lower half of the body, the cord experiences severe pressure, sufficient to interrupt if not wholly prevent its pulsations. It then becomes necessary to hasten the birth of the upper extremities and head by all prudent means. Violence is never in order in midwifery; but considerable force, skillfully directed may sometimes be safely used. After the shoulders are delivered, the passage of the head may be facilitated by carefully pulling down the

arms. Then, as soon as possible, introduce the finger into the mouth of the child. This will serve the double purpose, perhaps, of permitting a little air to make its way into the child's lungs, and of furnishing a hold by which its head may be gently drawn along into the world.

If there is much delay at this juncture, perhaps in some cases the child's life may be preserved by inserting into its mouth one end of a male catheter,—thus furnishing an open tube for the passage of air, until more vigorous pains shall introduce it into the full liberty of the atmosphere. While the head is yet undelivered, great care should be used to keep the child's body warm by covering it with flannel, and also to keep it in a correct relative position with the head. If the body be incautiously turned round, of course the neck will be twisted; and the child's subsequent delivery with a broken neck will be the miserable result, bringing confusion to the medical attendant, and unhappiness to all concerned.

Arm or Shoulder Presentation.—If the arm or shoulder present, the child will probably have to be turned. In case this cannot be effected, its chest must be opened and emptied of its contents, that there may be room to bring down the head. It is barely possible to avoid a resort to art in this presentation.

Flooding or Hemorrhage, occurring to an alarming extent, is happily one of the rare incidents or consequences of labor. But when it does occur, it demands the most serious and prompt attention.

Profuse bleeding from the womb is most commonly owing to a partial separation of the placenta, or afterbirth, from its attachment to the internal cavity; and it has been observed that the flow proceeds more rapidly from the detached portion of the afterbirth than from the corresponding exposed surface of the womb. A knowledge of this fact has an important practical bearing; for if, in severe cases of flooding, the partially detached afterbirth can be entirely separated, the bleeding will often be speedily arrested.

The most dangerous floodings occur in cases of *placenta previa*, when the afterbirth is over the mouth of the womb. In such cases, when the labor commences, and the womb begins to open itself, the afterbirth of course must be partially separated. These cases, unless promptly relieved by art, may prove fatal in a few minutes. Yet there is ordinarily sufficient time, if it be improved, calmly to choose and pursue the proper treatment. If the flooding be immediately dangerous to life, the child must be turned and delivered, or the *tampon* or *plug* be applied, as directed under the head of abortion. This expedient is used when, through rigidity of the mouth of the womb, the delivery is inadmissible.

Before Delivery.—In all cases of flooding, we prescribe quiet, the recumbent posture, cold applications to the abdomen and the external genitals, and the internal administration of astringents and anodynes (152).

After Delivery, our object is to promote contraction of the womb by cold applications and frictions externally, or, if necessary, by the introduction of the hand into the womb, for the purpose of removing the afterbirth, clearing out clots, or stimulating it to shut itself up for the expulsion of the offending substance. Until this contraction is secured, the plug should not be used, lest internal bleeding into the enlarged and expanded womb should be profuse, and fatally exhaust the patient.

After the Child is Born, our first duty is, if possible, to see that it breathes. In the vast majority of cases, the well-known cry which salutes the ear gives proof that the duty is unnecessary. But sometimes we do not hear the welcome sound. The umbilical cord may be once or repeatedly wound around the child's neck, and must be immediately removed to prevent strangulation; or, the child's mouth may be filled with phlegm, or some sticky mucus, which must be poked out with the finger, and its exit favored by turning the face downward; or, after tedious labors, the child may be born in a very feeble state, and may need the stimulus of cold water thrown suddenly, in small quantities, upon its chest and body, with considerable rubbing, and perhaps the inflation of its lungs with air blown into its mouth.

Tying the Cord.—When breathing is established, a piece of narrow tape or common twine is to be tied tight around the navel-string, about two inches from the child's navel, and the cord is then to be cut off, with a pair of sharp scissors, from half to three quarters of an inch outside the place where it is tied. The child is then to be delivered to the nurse.

The cord should be tied twice; the first about two inches from the child's body and again an inch and a half farther away. The cord is then cut between the two places. The object of the first tie is, of course, to prevent the child bleeding to death. The second is to prevent the blood from the after-birth or placenta soiling everything about the bed.

Washing the Child.—The child is now, while the physician is attending to the mother, to be washed and dressed by the nurse. Its skin is at this time covered with a suet-like substance, called the *vernix caseosa*. To remove this, a coat of warm sweet oil or lard may be lightly rubbed and mixed with this substance and then washed off with warm water and castile soap. It is not material that this coating should be absolutely all removed at the first washing; but the soap and water should be again gently applied in eight or ten hours from their first use. It is improper to use spirits for this cleansing. All rough rubbing must be avoided as injurious to the delicate skin of so tender an infant. Washing with cold water would lower the temperature to a dangerous degree, and should in no case be allowed.

Removal of the After-Birth.—The woman having rested fifteen or twenty minutes, a little gentle soliciting or pressure on the womb

will generally bring away the after-birth. If, however, any serious obstacle prevent its expulsion, it may be slowly and cautiously taken away by the hand introduced.

Cleansing the Bed, and Applying the Swathe.—Upon the removal of the afterbirth, a disinfected napkin is immediately applied to the external organs, a drink of water or tea administered, and another rest of an hour or more allowed. The swathe may consist of a towel pinned snugly around the body, or of a cloth, cut and fitted exactly for the purpose. Its object is to afford a firm and steady support to the contracting womb.

The Dressing for the Child's Navel should be so fixed that the navel-string or cord will not be left in contact with the healthy skin. To effect this, make a hole large enough to admit the cord in the centre of a piece of linen cloth four inches square; pull the cord through this hole, leaving the cloth lying flat upon the child's belly; then, having bandaged the cord down to the belly, fold the cloth over it, and apply the belly-band. The interposition of these dressings will thus keep the cord, which is dead and in process of decomposition, from irritating, and perhaps excoriating the living flesh, with which it must otherwise be in close contact. To wrap the stump of the cord in fresh absorbent cotton is another neat, dry, and practical method of treating it.

Never try to hasten the dropping of the cord if it occurs within a reasonable time, and from four to ten days may be expected to elapse before this event takes place. If pus appears, it shows that infective germs have gained entrance since the birth of the child, and a mild antiseptic dressing must be kept on or inflammation may strike in and the child die of blood-poison.

Nourishment of the Child., etc.—After being dressed, the child should be kept next the body of the mother or nurse, that it may receive the natural warmth thus to be derived. Its nourishment should be obtained exclusively from the mother's breast. If it is hungry, be sure and keep it so. There is nothing more appropriate than a hungry child all ready to take hold and exhaust the full and almost bursting breast on the third day, when the milk has come. Alas! How many children have been fed on sweetened water, and on milk and water, till they have lost all instinctive idea of, and all appetite for, nursing! and how many bowel complaints and broken breasts have been the miserable consequence! But meddling friends are afraid the "little dears" will starve; and therefore they must first be made sick by unnatural diet, and then for their cure be treated to that filthy, harsh, and indecent substitute for medicine, *chamber-lye and molasses!*

But it may be asked, "must not the child be fed at all, if it is hungry, and cries a great deal, and there is nothing in the mother's breast for it?" Such cases will be exceedingly rare, if the breasts have

been properly solicited from the first by a hungry child. When they do occur, being themselves exceptions, their treatment must be exceptional; but, even then, only so far as is absolutely necessary. If fed at all, the child should not be fed to satiety, but as little as the circumstances will possibly permit. The great rule remains: keep the child as hungry as possible till the milk comes. When it has to be fed, imitate the mother's milk as nearly as possible in the preparation of the artificial diet. A little sweet cream, warm water and sugar, should be so mingled, that in warmth, richness, and sweetness, the mixture may closely resemble human milk. (See page 486.)

Diet of the Mother.—For the first few days after confinement, the most appropriate diet for the mother is gruel, cocoa, rice-water, crust coffee, or some similar liquid nourishment. Different constitutions, however, need somewhat different management.

A woman naturally robust, and of full habit, should confine herself more strictly, and for a longer time, to this light diet, than one who is more slender and feeble. In some cases, weakly women require the juice of meat, and even wine or ale, as early as the second or third day. If she be subject to canker, or nursing-sore mouth, a generous diet is particularly serviceable. After the first week, she may gradually return to her customary diet.

Costiveness may be treated with the usual remedies. It was an old rule to give a dose of castor-oil on the third day, when there is a little increase of excitement in the system, from the filling of the breasts. This is not always necessary, and in most cases an injection would be far better. The mother should stay in bed from three to four weeks, according to the state of her general health. A little time now is a great gain later.

The Perpendicular Position.—During the first month, let the woman avoid being often or long on her feet. This is a very essential caution to avoid prolapsus, or falling of the womb, with all its attendant weaknesses and pains, and to ensure a good "getting up," with a sound womb, in the right place, and subsequent months of health and enjoyment.

Milk Leg.—*Phlegmasia Dolens.*—*Crural Phlebitis.*

THE popular idea is, that in this disease the woman's milk has fallen into her leg, which has inflamed. This is of course absurd. As to the real nature of the complaint, there are various opinions,—some holding it to consist in inflammation along the sciatic, crural, and pubic nerves; others, that it is an inflammation of the lymphatics of the groin which causes it; others, that it is an inflammation of the crural veins. The fact of the matter is that this disease is one of the many evidences of septic matter entering the circulation and setting up local trouble where it is deposited. It is, in other words, a mild form of pre-existing blood-poisoning.

Symptoms.—The disease begins in from two to seven weeks after delivery, with pain in the lower bowel, groin or thigh. The pain is more violent when the thigh is extended. In a day or two, the pain diminishes, and the limb begins to swell, frequently in the calf of the leg first, thence extending upward; but generally in the groin, and extending gradually down. The skin becomes entirely white, smooth, and glossy, does not pit when pressed, is painful to the touch, and is hotter than the skin upon the other limb. In connection with this local disease, there is general fever, with small and rapid pulse, thirst etc.

Treatment.—The patient must lie flat upon her back, with the swelled limb placed upon pillows, or a bolster, raised so that the foot shall be a little higher than the hip, and then charged not to put her foot down upon the floor until she is very nearly well.

Take a large piece of flannel,—Dr. Meigs says an old flannel petticoat, with the hem and the gathers cut off—and dip it in vinegar and *hot* water, equal parts; wring it out, and cover the whole limb with it. Put a piece of blanket or oiled silk over it to keep it from wetting the bed. Repeat this and keep it up for six hours. When it becomes tedious to the patient, remove it, and bathe the limb with warm sweet-oil, two parts, and laudanum, one part, and cover it with flannel. In two or three hours, return to the first application of hot water and vinegar. Continue this for five or six hours, and then take warm sweet-oil and laudanum; and thus pass from one to the other until the inflammation is subdued, or, as Dr. Meigs says, till the calf of the leg can be shaken.

If the bowels are confined, let them be gently moved by some mild physic (13), (14), (18), (25), (27), (41).

In many cases, diuretics and cathartics *combined* will be proper (302), or diuretics only (128), (130).

While the inflammation lasts, and there is fever, the tincture of *veratrum viride* must not be forgotten.

If recovery does not take place after the active inflammation has subsided, the limb should be bandaged from the toes to the groin.

Wrap up the leg in wet flannels, covered air-tight with rubber cloth, and great quantities of water will exude from the leg.

Child-Bed Fever.—Puerperal Fever.—Septicæmia.— Blood-Poisoning.

FEW complaints more justly excite the dread of the practitioner than this. It cuts down woman at a time when she can least of all be spared by her young offspring, and at a moment when she most excites the love and sympathy of her whole family. It is a terrible disease.

Until after the discovery of the germ character of many diseases, this fearful scourge was only suspected by medical men to be con-

tagious. It has, however, long since been found to be highly contagious and propagated by the ordinary routes of travel by physician, nurse, friend, etc., who come in contact with women about to be confined or with people who have open wounds.

We know that when a woman is confined the germs which naturally belong on the skin and in the vagina, if introduced into the little lacerations and wounds which are liable to ensue during labor, set up a violent form of blood-poisoning, which, for its severity, rapidity of development, and direful consequences, surpasses all other infectious diseases. Child-bed fever is purely and simply a germ-disease, caused by unclean hands, unclean instruments, unclean napkins, or in fact, anything which contains germs, being brought in contact with the mother. For a further understanding of this causation, see articles on Asepsis, Antisepsis, etc.

It becomes quite necessary for a woman to regard herself as about to undergo a surgical operation when she is to be confined, for the simple reason that she should be prepared for the labor just as the patient is for the operation, that she may have all the advantages of skilled nursing and the many little antiseptic precautions which render not only operations but labor itself safe.

Symptoms.—The train of symptoms belonging to this dreadful malady are too well known to many to repeat them in much detail. The first that one carefully observant of the sick one notices, is a slight rise of temperature, then perhaps follows a chill, sweating and headache; discharges begin to smell badly, the bowels enlarge from the formation of gas; the stomach is upset, and finally, if the disease is not checked, the infection spreads to the tubes and ovaries and into the general abdominal cavity, when death soon steps in to end the frightful scene.

Treatment. — The nurse should always be on the alert to discover the least rise in temperature or any beginning odor; it is just here that valuable time is often lost. The womb has become infected but as yet the septic inflammation is only on the inside of the organ. At this point vigorous measures must be at once inaugurated and the womb thoroughly irrigated with some disinfectant solution, like the corrosive sublimate solution, with carbolic acid solution or sulpho-naphthol solution. If this measure, repeated every eight to twelve hours, does not speedily correct the odor, lower the temperature and improve affairs at once, a thorough curetting of the entire lining of the womb must be made, as described under womb-diseases (page 435) and the organ daily irrigated or packed with iodoform gauze.

In many cases the womb and its belongings may have to be removed entirely. Blood tonics must be employed from the first, and the infection thoroughly removed lest subsequent womb troubles ensue.

It is a well known medical fact that in blood-poisoning the use of alcohol may be pushed to a degree that would be thought unwise in

other troubles. Enough whiskey or brandy should be given to a patient to keep him stimulated until such time as the temperature and the pulse are in normal condition.

The chief preventive of this disease is extreme cleanliness and care in warding off its causes.

Puerperal Convulsions.—*Eclampsia.*

DURING the latter part of pregnancy, and even during the lying-in period, a pregnant woman may be suddenly seized with a convulsion from which she may never recover consciousness. These fits generally last a few minutes, and complete consciousness follows with a terrific headache; from one to a hundred more attacks may ensue. The urine usually is found heavily loaded with albumen, and contains all the evidences of serious kidney disease.

Causes.—These disorders are supposed to be due to the pressure on the kidneys and its vessels by the increasing growth of the child. Some cases, however, remain still unsatisfactorily explained.

To avoid any such sudden surprises women should have their urine examined every week or two in the latter part of pregnancy.

Symptoms.—The disease is usually ushered in by some slight frontal headache, by swelling of the feet, ankles and eyelids; these are symptoms of impending trouble, and precautions should at once be taken to ward off the consequent disease. The urine becomes scanty, thick and smoky; the face or eyelids twitch, and soon the fit comes on, superinduced by the large amount of urea retained in the blood in consequence of the crippled condition of the kidneys, which normally throw off these poisonous products.

Treatment.—In most cases the womb must be immediately emptied of the child and pressure thus moved from the kidneys, which are stimulated to secrete freely. The fits are for the time being controlled by the inhalation of ether or chloroform. Bleeding, the free use of *veratrum viride*, and the use of chloral or even morphine will materially aid the case toward recovery.

Sweating the patient will many times turn the tide in favor of recovery. Covering the body with hot wet sheets and over these several dry blankets may be placed. It is advisable to keep the head cool by means of cold cloths or an ice bag. A subcutaneous injection of apomorphine given in 1-10 gr. dose will start the perspiration. The hot air bath by means of a kerosene or alcohol lamp under a stovepipe funnel bent at a right angle over the foot of the bed is another valuable means to accomplish the same result. The temperature of the heated air should be 110° to 115° and the patient gradually cooled off after twenty to thirty minutes perspiration.

It is a very fatal disorder if left to itself, the patient not infrequently dying in the first convulsion, after prolonged unconsciousness.

Here again the early discovery of the disease will often be sufficient to turn the tide in a favorable direction.

Flooding and Hemorrhage.—*Placenta Praevia.*

SOMETIMES during the latter months of pregnancy quite a little hemorrhage starts up from the fact that the afterbirth, which normally is attached to the side of the womb, becomes engrafted into the lower segment so as to cover the opening into the womb. This latter is often separated from its moorings and considerable hemorrhage ensues, which may vary from a small to an extremely large and fatal amount. The physician should be summoned immediately and labor induced at once, if this condition is really found to exist.

Flooding after labor is due to a relaxed womb or some open blood-vessel. The womb is to be seized and squeezed together into a small mass, driving out clots; one teaspoonful of ergot in a little hot water is to be taken, and the foot of the bed elevated till the arrival of the doctor.

Nursing Sore Mouth.

NURSING women sometimes suffer terribly with this complaint. It begins with a scalding sensation upon the tongue, a pink color in the roof of the mouth, and a hot, watery discharge from the mouth. After a few days, small ulcers appear on the tongue, and in the throat. Costiveness is generally present; but when the ulceration extends to the bowels, diarrhoea occurs. It comes to an end upon weaning the child.

Treatment.—To relieve costiveness, give some gentle cathartic (12), (15), (25), (34), (36).

Iron in some of its forms and combinations is highly necessary (61), (71), (73), (349).

Gargles will frequently do much good (227), (229), (230), (235), (243), (244), (347), (350).

The diet must be simple, nourishing, and digestible, consisting of stale bread, tender beefsteak, broths, etc.

Inflammation of the Breast.—Broken Breast.— *Mammary Abscess.*

THE mammary gland, or gland which secretes milk in the human breast, consists of a number of ducts, passing inward from their termination in the nipple, and then spreading around like the roots of a tree, and terminating in minute glands. The mammillary tubes are straight ducts, ten or twelve in number, having their mouths at the centre of the nipple, dilating at its base into larger reservoirs, which extend some distance into the gland. (Fig. 146.)

When milk is first formed, after confinement, these tubes and reservoirs sometimes get so full and hard that they crowd and compress each other, making it difficult to remove the milk, and under these circumstances, the breast will inflame.



FIG. 140

Symptoms.—The inflammation generally begins with a chill, followed by fever, and pain of a shooting kind, which is much increased by pressure. An examination will generally reveal a circumscribed, hard, and painful tumor, even before there is any redness on the surface. After a time, the swelling spreads, the skin becomes of a dusky red, is hot and shining, will frequently pit a little on pressure, and soon gives a sense of fluctuation. Upon the formation of matter, the breast is enlarged, and there is local tenderness and throbbing pain.

This complaint may be caused by taking cold, irregularities in diet, or by mental emotion; but more commonly it is caused by accumulation of milk within the ducts; still more commonly by septic matter from the uterus entering the circulation and causing a localized blood-poisoning.

Treatment.—These afflictions may generally be *prevented* by keeping the breasts well drawn. It is the duty of a nurse to look well after this matter, and see that the breasts do not get hard and distended with milk.

But when the inflammation has fairly set in, the first aim should be to prevent, if possible, the formation of matter.

Active purging should be resorted to at once (29), (32). Sweating should be encouraged by the tincture of *veratrum viride*. If the object be to prevent the formation of matter, cold lotions, or cold water compresses should be used freely; but if two or three days have passed before active treatment, the suppuration will go on, and it is better to use *warm* applications. Dewees says warm vinegar is the most beneficial as well as the most comforting. Poultices and warm fomentations are much used. Some apply stimulating liniments, made of essential oils, etc. (195), (198). Leeches are often used with advantage. They should be applied, not upon the breast, but just below it.

During the progress of the disease, especially after the abscess is opened, the breast should be supported, and prevented from hanging down, by long strips of adhesive plaster carried below and around it. By this means a gentle pressure is kept up by which the matter is more easily evacuated.

The breast should be opened with a lancet as soon as the abscess points, or fluctuation is discovered. Should the ulcer not heal, an astringent wash, such as a weak solution of nitrate of silver (211), may be applied to it once or twice a day.

During the discharge of matter, the system of the patient should be supported by a nourishing diet, wine, tonics, etc. To lift up the breasts, and at the same time gently compress them with a gauze or thin flannel bandage, is one of the best methods of treatment.

Sore Nipples.

WOMEN suffering from excoriated nipples are apt to keep the infant chiefly to the healthy breast, and only to apply it to the tender side for the purpose of obtaining present ease from the pain of over-dis-

tension. In this way the ducts remain always full, and are apt to get inflamed. Sore nipples, therefore, are to be attended to as much on account of the evils to which they lead, as of the suffering they directly occasion.

The excoriation of the nipples begins as a chap. This shows no tendency to heal; and the child's mouth being often applied, rubs off the skin around the crack, and this naked surface soon becomes an ulcer. These ulcers are sometimes only on the surface; at other times they are profound, going deep into the substance of the nipple.

Treatment.— These excoriations and ulcers might be easily healed, were it not that the newly-formed skin is apt to be continually rubbed off by the child's mouth in the act of nursing. Two things are therefore to be done, — to favor the healing, and to protect the tender part from renewed injury.

For the first object, a strong infusion of green tea or port wine may answer very well in ordinary cases. A little alum or borax, dissolved in rosewater, or water (201), (202), is often used. A weak solution of sulphate of zinc, or sulphate of copper, or nitrate of silver (209), (211). But one of the very best articles is composed of glycerine and tannin (306).

To protect the nipple from injury in the act of sucking, use a shield made of India-rubber. When the infant is not at the breast, the nipple should be covered by a shield.

Sex of Child—How to Regulate Before Birth.

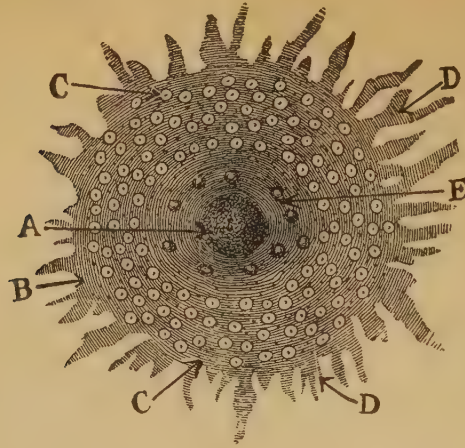
When a Male Child is Desired.—Before cohabitation the husband should eat nothing but good, substantial food, take long, hard exercise in the open air, read light literature, abstain from indulgence for some time before the procreative period. The wife should abstain from animal food but should eat vegetables and farinaceous articles of diet, exercise daily until almost fatigued and pass the time with older females than herself.

After pregnancy the wife should eat a great deal of meat, eggs and vegetables, but little or no pastry or sweets, and should take walks and exercise in the open air every day.

When a Female Child is Desired.—Exactly the opposite course should be taken. The wife should eat the most stimulating food, should not indulge the passions and should reserve her whole vigor and strength for the desired time. The husband should take violent exercise until fatigued and a hot bath every night.

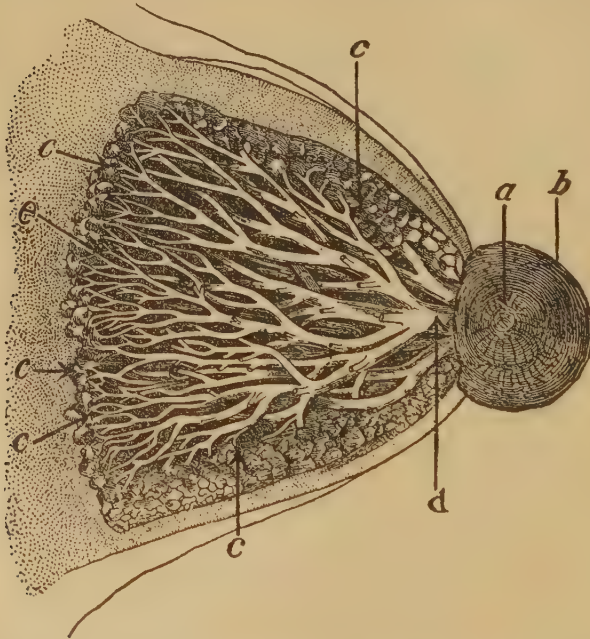
After pregnancy the wife should eat little meat but should live mostly on farinaceous food and take short walks in the open air, but not enough to get tired, and should sleep as much as possible.

Nipple Enlarged to Show Change in Pregnancy.

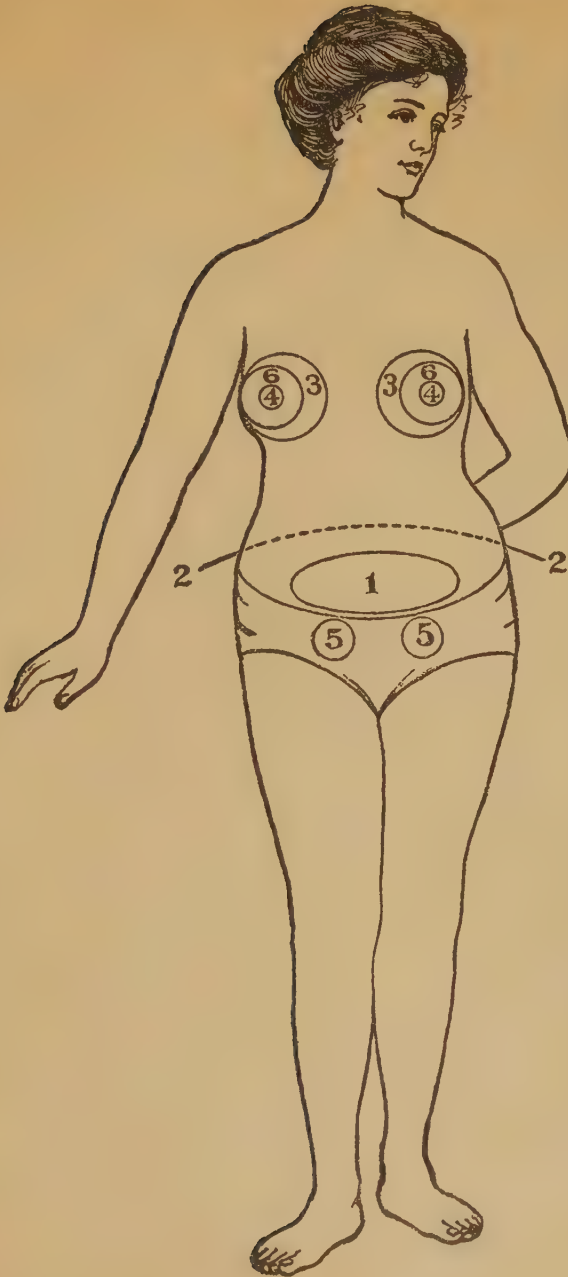


A. The Nipple. B. Fatty Tubes. C. Spots on the Colored Ring around the Nipple. D. Marks caused by enlargement of Skin. E. Follicles in the Areola.

Mammary Gland in Woman (Breasts).



A. Nipple. B. (Areola) Colored Ring around Nipple. C. Lobes Covering Milk Glands. D. The Conduits which Contain the Milk (enlarged). E. Extremities of the Milk Conduits.



1. Painful Menstruation.—Apply hot water bottle or hot poultice to the lower portion of the abdomen and rub the skin of the abdomen well with the following liniment.

Camphor Liniment, 6 ounces; Fluid Extract of Belladonna, 1 drachm; Fluid Extract of Henbane, 1 drachm. Mix and apply.

2. Absence or Stoppage of Menses.—On retiring rub thoroughly the lower portion of the back from hip to hip with the following:

1½ drachms of Chloroform; 3½ drachms of Ether; 2 ounces of Camphor. Mix and apply as above.

3. To Check Secretion of Milk.—Apply to the breasts from four to six times daily a liniment made of the following:

2 drachms of Camphor; 6 drachms of Tincture of Belladonna, and 1½ ounces of Oil of Terebinth.

4. Sore Nipples.—Dissolve 1 drachm of Tannin in 1 drachm of Glycerine. Apply several times daily. This is an excellent remedy. Be sure and wash off before nursing the baby.

5. Inflammation of the Ovaries.—Rub the parts shown on diagram night and morning with an ointment made from the following:

1 ounce of Mercurial Ointment; 1 ounce of Extract of Belladonna; 1 ounce of Extract of Henbane, and 10 grains of Camphor.

6. Broken Breast.—Warm vinegar applied is very comforting, or apply liniment made of the following essential oils.

2 drachms of Oil of Hemlock; 1 drachm of Oil of Origanum; 1 drachm of Camphor; 1 drachm of Opium; 4 ounces of Alcohol. Mix and apply.

PREGNANCY TABLE ; OR

MARRIED LADIES' PERPETUAL CALENDAR.

THE utility of these tables, serving as a faithful and confidential friend in matters of urgent interest, cannot fail of being perceived. The young and newly-married might be spared an unpleasant amount of embarrassment by consulting the Calendar as to the time of confinement, which, in reckoning the full period of gestation 280 days from conception, may be very nearly approximated; or, in the event of the time of conception being uncertain, from the period of quickening, which she can usually note, she may reckon 140 days. It will be perceived that the Calendar has three columns of figures, denoting the days of the months noted at the head of each. The first column gives the date of conception; the second, that of the period of quickening; and the third, that of delivery. Thus, if a lady dates the period of conception January 1, the quickening will occur May 20, and confinement about the 8th of October following; or, if she is ignorant of the time of conception, by consulting the middle column as to the time of quickening, if it occurs May 20, she may expect her confinement to occur about the 8th of October following, or 140 days after the period of quickening. The date in the first column is that of conception; the corresponding date in the second column is that of quickening; and the corresponding date in the third column that of confinement.

JANUARY.			FEBRUARY.			MARCH.			APRIL.		
Concep- tion. Jan.	Quick- ening. May	Deliv- ery. Oct.	Concep- tion. Feb.	Quick- ening. June	Deliv- ery. Nov.	Concep- tion. March	Quick- ening. July	Deliv- ery. Dec.	Concep- tion. April	Quick- ening. Aug.	Deliv- ery. Jan.
1	20	8	1	20	8	1	18	6	1	18	6
2	21	9	2	21	9	2	19	7	2	19	7
3	22	10	3	22	10	3	20	8	3	20	8
4	23	11	4	23	11	4	21	9	4	21	9
5	24	12	5	24	12	5	22	10	5	22	10
6	25	13	6	25	13	6	23	11	6	23	11
7	26	14	7	26	14	7	24	12	7	24	12
8	27	15	8	27	15	8	25	13	8	25	13
9	28	16	9	28	16	9	26	14	9	26	14
10	29	17	10	29	17	10	27	15	10	27	15
11	30	18	11	30	18	11	28	16	11	28	16
12	31	19		July		12	29	17	12	29	17
	June		12	1	19	13	30	18	13	30	18
13	1	20	13	2	20	14	31	19	14	31	19
14	2	21	14	3	21		Aug.			Sept.	
15	3	22	15	4	22	15	1	20	15	1	20
16	4	23	16	5	23	16	2	21	16	2	21
17	5	24	17	6	24	17	3	22	17	3	22
18	6	25	18	7	25	18	4	23	18	4	23
19	7	26	19	8	26	19	5	24	19	5	24
20	8	27	20	9	27	20	6	25	20	6	25
21	9	28	21	10	28	21	7	26	21	7	26
22	10	29	22	11	29	22	8	27	22	8	27
23	11	30	23	12	30	23	9	28	23	9	28
24	12	31		Dec.		24	10	29	24	10	29
	Nov.		24	13	1	25	11	30	25	11	30
25	13	1	25	14	2	26	12	31	26	12	31
26	14	2	26	15	3		Jan.			Feb.	
27	15	3	27	16	4	27	13	1	27	13	1
28	16	4		17	5	28	14	2	28	14	2
29	17	5	28			29	15	3	29	15	3
30	18	6				30	16	4	30	16	4
31	19	7				31	17	5			

MAY			JUNE			JULY			AUGUST		
Concep- tion	Quick- ening	Deliv- ery	Concep- tion	Quick- ening	Deliv- ery	Concep- tion	Quick- ening	Deliv- ery	Concep- tion	Quick- ening	Deliv- ery
May	Sept.	Feb.	June	Oct.	March	July	Nov.	April	Aug.	Dec.	May
1	17	5	1	18	8	1	17	7	1	18	8
2	18	6	2	19	9	2	18	8	2	19	9
3	19	7	3	20	10	3	19	9	3	20	10
4	20	8	4	21	11	4	20	10	4	21	11
5	21	9	5	22	12	5	21	11	5	22	12
6	22	10	6	23	13	6	22	12	6	23	13
7	23	11	7	24	14	7	23	13	7	24	14
8	24	12	8	25	15	8	24	14	8	25	15
9	25	13	9	26	16	9	25	15	9	26	16
10	26	14	10	27	17	10	26	16	10	27	17
11	27	15	11	28	18	11	27	17	11	28	18
12	28	16	12	29	19	12	28	18	12	29	19
13	29	17	13	30	20	13	29	19	13	30	20
14	30	18	14	31	21	14	30	20	14	31	21
15	Oct.		15	Nov.		15	Dec.		15	Jan.	
16	1	19	16	1	22	16	1	21	16	1	22
17	2	20	17	2	23	17	2	22	17	2	23
18	3	21	18	3	24	18	3	23	18	3	24
19	4	22	19	4	25	19	4	24	19	4	25
20	5	23	20	5	26	20	5	25	20	5	26
21	6	24	21	6	27	21	6	26	21	6	27
22	7	25	22	7	28	22	7	27	22	7	28
23	8	26	23	8	29	23	8	28	23	8	29
24	9	27	24	9	30	24	9	29	24	9	30
	10	28		10	31		10	30		10	31
25	11	March	25	11	April	25	11	May	25	11	June
26	12	1	26	12	1	26	12	1	26	12	1
27	13	2	27	13	2	27	13	2	27	13	2
28	14	3	28	14	3	28	14	3	28	14	3
29	15	4	29	15	4	29	15	4	29	15	4
30	16	5	30	16	5	30	16	5	30	16	5
31	17	6	31	17	6	31	17	6	31	17	6

SEPTEMBER			OCTOBER			NOVEMBER			DECEMBER		
Concep- tion	Quick- ening	Deliv- ery	Concep- tion	Quick- ening	Deliv- ery	Concep- tion	Quick- ening	Deliv- ery	Concep- tion	Quick- ening	Deliv- ery
Sept.	Jan.	June	Oct.	Feb.	July	Nov.	March	Aug.	Dec.	April	Sept.
1	18	8	1	17	8	1	20	8	1	19	7
2	19	9	2	18	9	2	21	9	2	20	8
3	20	10	3	19	10	3	22	10	3	21	9
4	21	11	4	20	11	4	23	11	4	22	10
5	22	12	5	21	12	5	24	12	5	23	11
6	23	13	6	22	13	6	25	13	6	24	12
7	24	14	7	23	14	7	26	14	7	25	13
8	25	15	8	24	15	8	27	15	8	26	14
9	26	16	9	25	16	9	28	16	9	27	15
10	27	17	10	26	17	10	29	17	10	28	16
11	28	18	11	27	18	11	30	18	11	29	17
12	29	19	12	28	19	12	31	19	12	30	18
13	30	20									
14	31	21									
			13	March		13	April		13	May	
15	1	22	14	1	20	14	1	20	14	1	19
16	2	23	15	2	21	15	2	21	15	2	20
17	3	24	16	3	22	16	3	22	16	3	21
18	4	25	17	4	23	17	4	23	17	4	22
19	5	26	18	5	24	18	5	24	18	5	23
20	6	27	19	6	25	19	6	25	19	6	24
21	7	28	20	7	26	20	7	26	20	7	25
22	8	29	21	8	27	21	8	27	21	8	26
23	9	30	22	9	28	22	9	28	22	9	27
			23	10	29	23	10	29	23	10	28
			24	11	30	24	11	30	24	11	29
			25	12	31	25	12	31	25	12	30
24	10	July									
25	11	1									
26	12	2	25	13	Aug.	25	13	1	26	13	1
27	13	3	26	14	1	26	14	2	27	14	2
28	14	4	27	15	2	27	15	3	28	15	3
29	15	5	28	16	3	28	16	4	29	16	4
30	16	6	29	17	4	29	17	5	30	17	5
		7	30	18	5	30	18	6	31	18	6
			31	19	6						

CARE OF CHILDREN AND THEIR DISEASES

When children reach the age of six years it is most important that they be examined yearly by a competent physician for the following complaints, as many children suffer in silence and become backward in their growth both physically and mentally when by a little precaution on the part of their parents such cases could be avoided.

HAIR and SCALP~for dandruff and skin troubles. PAGE 179

EYES~for correct sight. Page 54

EARS~for cleanliness. Page 652

NOSE~for adenoids and obstructed breathing. Page 240

MOUTH, TEETH~for imperfections. **TONSILS** for enlargements. see Index

THROAT~for general condition. Page 236

NECK~for enlarged glands. Page 45

HEART and LUNGS~general condition. see Index

SPINE~for curves and roundshoulders. Page 640

SKIN~for rash or infectious diseases Page 155

FEET~for flatfoot Page 672



CARE OF CHILDREN AND THEIR DISEASES.

Pure Air. — The first want of a child is a plenty of fresh air; and this want never ceases to the end of life. Impure air kills thousands of infants. Out of 7,650 born in the lying-in hospital of Dublin, 2,944 were destroyed by impure air within two weeks after birth.

Children should be kept in the open air as much as possible, and in well-ventilated rooms when indoors. It is wrong, when infants are sleeping, to cover their faces with bed-clothes, or draw curtains around their cots, or to envelop their heads in blankets and shawls when carried in the open air.

The Skin. — The health of infants requires that their skin should be kept clean. Unless this is done they are liable to suffer much from cutaneous and other diseases. The skin of a new-born child is covered with a white, unctuous matter, called the *vernix caseosa*. It is injurious to let this remain for any length of time after birth. To remove this, Dr. Dewees recommends that the child be smeared with hog's lard or sweet oil, and then washed with soap and water. Dr. Eberle says, smear with yolk of egg, and then wash with simple warm water.

The young child should be washed every day with warm water, — then, after a time, with tepid water, then with temperate, and finally, after it is some months old, with cold water. This, if persevered in through childhood and youth, will ward off a thousand ills and sicknesses to which the young are liable.

The Clothing of Children should be so adjusted as to give their limbs ample play, and should be thick enough to keep them *warm*. They ought to have flannel next the skin in winter, and cotton in summer. At the risk of wounding some nice people's feelings, I must add that the *fashion* of a child's clothes is not important.

The Food. — The natural and proper food of a young child is its mother's milk. To this it should be confined, unless prohibited by imperative circumstances, until a portion of the teeth are cut. When the mother cannot nurse her child, the breast of a suitable nurse should, if possible, be supplied. If the infant need any more food

than is supplied by the breast, give cow's milk and water, sweetened with a little loaf sugar. The nursing bottle, if used, must never be permitted to get sour.

Health of a Nursing Woman. — During nursing the greatest attention to health is required by the mother or the nurse. A woman of a consumptive constitution should never nurse an infant. Nourished at the breast of such a mother, the child, who has inherited her constitution, will be the more likely to fall a victim to her disease.

Passions of a Nursing Woman. — Let the woman who nurses a young child be careful of her passions. An irritable disposition, giving rise to gusts of violent passion, may so alter the character of the milk as to throw the child into convulsions. Grief, envy, hatred, fear, jealousy, and peevishness, unfit the milk for nourishing the child, and often cause the child's stomach to be much disordered.

The Diet of the Nurse should receive strict attention. It should be plain and wholesome, and the amount should never be excessive. Her drink should be simply water and non-stimulating and nourishing drinks such as the various preparations of cocoa, etc. She should take gentle daily exercise in the open air.

Wet Nurses. — If for any reason it should be necessary to wean the baby, or the mother cannot nurse the child, then we must select a food the most like that of the mother.

Wet-nurses formerly were quite popular among the well-to-do to supply this food; but as in her selection there are so many exacting requirements, she is fast becoming obsolete. There are three requisites for a good wet-nurse: she must be of good health, of good moral character, and be able to supply plenty of good healthy milk.

If she has any tubercular, scrofulous, syphilitic, insane or osseous history; if she is menstruating, or pregnant, or is in anywise below par in health, she is necessarily disqualified as a nurse for any child; only your physician may be able to detect these evidences and perhaps not even he. If, on the other hand, she is occasionally given to blues, has a violent temper, is jealous, or fretful, or worries about her own child, or goes into dangerous company when away from the house, then you have added a second disqualification. Again, her supply of milk must be good as shown by an analysis and the health and growth of her own child. A nurse may pass muster to-day in reference to this third requisite, but perhaps not in a week from to-day.

Seeing that the average wet-nurse comes from a lower stratum of society, even if not from the criminal class, that she is in consequence more liable to acquired disease and contagion, that she is more than likely to bring trouble into the household rather than to relieve the household of it, it will be extremely difficult for you to find such a person as can furnish all the required conditions of a safe wet-nurse.



Hold the baby this way.



Not this way.



To quiet the baby.



Hold the baby this way when feeding.

It has been found, therefore, that artificial feeding gives better satisfaction and is quite as safe.

Nursing Bottles. — There are nursing bottles innumerable, few of which are of practical value. A simple bottle with plain black nipple is all that is requisite for successful feeding at the hands of a careful and cleanly mother or nurse. There should be several bottles and several nipples, the latter to be kept in soda water or other simple alkaline solution when not in use. A pinch of soda to a cup of water is of sufficient strength. After a bottle has been used it should be thoroughly scalded with hot water and soda and finally set away filled to the brim with this same solution, till later in the day. Meanwhile, a fresh bottle and a fresh nipple is used, they having first been cleansed with the above solution. The best bottle, however, for nursing in those cases, where for want of time and means the bottle cannot be held by mother or nurse, is one called "The Best." See Figs. 147 and 148, This bottle, like many others, al-

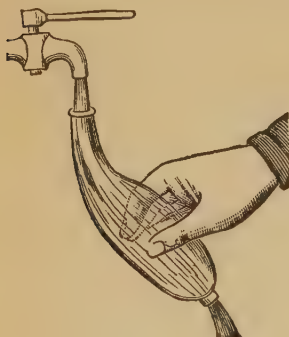


FIG. 147.



FIG. 148.

lows of its resting on the bed, but, unlike many others, it is very readily cleansed, is of easy suction and has a nipple which does not collapse. The accompanying cuts and description are worthy of attention. The peculiar feature of the bottle is a valve or air-inlet in the end admitting air back of the food, thus rendering suction easy. This valve does not leak and cannot be pulled off by the baby, but is easily cleansed and adjusted. Whatever else you may do with the bottle, above all things keep it clean, not only to outward appearances, but by actually scalding and soaking in soda solution up to the very time of its use.

Food for Infants. — It has been found that mother's milk, which of course is the best food for babies, is composed on the average of the following ingredients: water 87, fat, 4, casein 1, sugar 7, ash 1, and slightly alkaline in reaction.

Now, ordinary cow's milk has the following composition: water 87, fat 3.7, casein 2.9, sugar 4.9, ash .4; it is slightly acid.

We can therefore see that if we take cow's milk and dilute it with water sufficiently, we diminish the amount of casein to that of mother's milk, and by the addition of cream, milk, sugar and lime-water, we raise these constituents to the standard found in human milk. This mixture, known among medical men as the "Meigs' Cream Mixture," is the basis of all modern compounds for artificial feeding.

Milk, as ordinarily received from the milkman, swarms with bacteria and germ-life which, under favorable conditions, quickly changes the milk and renders it unfit for easy and proper digestion. Milk from the mother is devoid of these germs, or, as medical men say, it is sterile. This attribute then is in reality quite as important as the proper constituency of milk. The process of making cow's milk sterile is called *sterilization*, of which we will speak shortly

Temperature of Milk. — Mother's milk is of the same heat as the body, or nearly so; hence common sense dictates that the artificial food must be of that degree of heat, or, about 98° Fahrenheit.

Quantity and Interval of Feedings. — The capacity of a baby's stomach and the length of time food remains in it are matters of experience. Herewith is appended a table covering the general rules of feeding infants and especially adapted to milk and cream mixture of which we will now speak.

GENERAL RULES FOR FEEDING.

AGE.	Interval. Hours.	Feedings in 24 Hours.	Amount at each Feeding. Ounces.	Amount in 24 Hours. Ounces.
1st week	2	10	1	10
1st to 6th week	2½	8	1½ to 2	12 to 16
6th week to 6th month	3	6	3 to 4	18 to 24
At 6 months	3	6	6	36
At 10 months	3	5	8	40

— Dr. F. M. Rotch, Keating's Cyc. Dis. Children.

Based on the average analysis of mother's milk, i. e., 7 parts sugar, 4 of fat, and 1 of albuminoids, we must take: cream 1½ ounces, milk 1 ounce, water 5 ounces, lime-water ½ ounce, sugar of milk 3 to 3½ drachms.

The milk-sugar is to be obtained at the druggist's. This gives an eight-ounce mixture, so that for a baby four weeks old (see table) we need to take about one-half or three-fourths more of this mixture; for a baby six months three times this amount, and so on. For a child newly born, after the first few days, when only a little should be given, only slightly more of these ingredients should be used than in above formula.

The prescriptions which could be used for the first week of nursing would be much changed at the time of weaning, so that one

formula is too arbitrary to be of general use. Therefore while the one given is useful at a certain period, it is best to have several formulæ to work upon in order that should one prove too strong or too weak another one may be tried. Therefore, after the first week if the child is not thriving on the mother's breast and it is necessary to feed it artificially we may take a mixture of 5 ounces of cream, 1 ounce of lime water, 14 ounces of plain water sterilized to which we add 8 teaspoonfuls of sugar of milk. About three or four tablespoonfuls should be fed every two hours. For a child two to six months old, we take 16 ounces of cream, 5 ounces of milk, 2 ounces of lime water and 18 ounces of sterilized water to which we add a teaspoonful of sugar of milk. For a child ten months old we take 16 ounces of cream, 15 ounces of milk, 2 ounces of lime water, seven ounces of ordinary water and a teaspoonful of milk sugar. The amount given at each feeding should be according to the table given. It will be noticed that the proportions of milk to water increase in favor of the milk as the age of the child increases, so that by weaning time the child is much better able to digest undiluted milk. Any formula may be modified in any of the proportions given to meet an individual case. The cream that is spoken of, means the top of a can of milk that has stood six or eight hours. It may be scooped off with a cup or removed by siphonage, the addition of lime water is always necessary as cow's milk is usually acid and the child's stomach is constructed to digest an alkaline food.

When the back teeth, or molars, have come through, then, for the first time, bread, rice, and soft-boiled egg may be added.

Oatmeal jelly may be prepared by boiling a quarter of a pound of oatmeal, in a quart of water, down to one pint. This mixture is then to be diluted with an equal quantity of boiled water and strained through a cloth. Should the oatmeal prove too laxative for the child, barley jelly may be made in the same way.

Sterilization of Milk.—We have seen how much more important than the kind of nursing-bottle that may be selected is the kind and quality of food put into that bottle. To complete our consideration of the best artificial food, we must know how to render the milk free from bacterial life; this process is called sterilization, and may be accomplished in a simple way as follows: into as many bottles, which have been previously scalded and cleansed, as there are to be feedings in the twenty-four hours, pour that quantity of the milk mixture which is to be given at a feeding; place these bottles, with absorbent cotton in the mouths, into a kettle filled with water up to the level of the milk in the bottles, and allow the water to rise to 170° Fahrenheit, when the kettle is removed to a warm part of the stove and covered for about half an hour. The bottles should then be kept in a cold place till used, when they are to be heated just sufficiently to correspond to the body heat. These bottles come ready made, also a rack in which to rest them in the kettle. They should be, in

reality, specially made bottles, and are to be obtained at any drug-store. They are ready for the baby's use after removing the cotton and attaching the nipple. One may, however, sterilize the entire feeding of the twenty-four hours, or for twelve hours, as thought best, in any clean, thin bottle or jar, and pour out the given amount required at each feeding; but there is some danger of spoiling the sterilization by so much handling. Should it be desirable to prepare milk to keep for a longer time, it will then be necessary to sterilize at a greater heat (212°), and to repeat the process two or three times. Such milk is supplied nowadays in the larger cities by companies who will express it daily to one's address.

With the appearance of greenish colored, foul smelling stools, we may assume that fermentation processes are taking place and very little can be accomplished in the way of relief until the trouble has been swept away. A sudden change of weather most likely to occur when a warm day suddenly changes to a cold one, milk that has not been properly sterilized or has been opened in places where it could absorb odors, in an ice chest or near vegetables, or again where it comes from cows more or less unhealthy, or kept in bad surroundings may cause this trouble even without the child having other sickness. Small doses of calomel best given in 1-10 grain doses every half hour until the bowels have moved two or three times or until 12 to 20 doses have been given. Following the movement of the bowels when the calomel is to be stopped we give some simple astringent like bismuth subnitrate in 5 grain doses every two hours to coat the bowels and soothe inflammation.

Weaning.—At the end of twelve months, the first set of teeth are generally so far cut that the child can manage most kinds of plain food; and it may now be taken from the breast. Should the teeth appear earlier, and the infant be healthy, it may be weaned even at the end of the tenth month. Never take the child from the breast in the midst of summer heat. A disordered state of the bowels, or cholera infantum, would be likely to be the result. The spring and the autumn are the proper periods for weaning.

If for some months it has been accustomed to other food besides the milk of the mother, it may be taken suddenly from the breast. It must not have any amount of solid food it may crave immediately after weaning. It should still be kept, for some time, upon a simple, bland, half-fluid aliment, taken in moderate quantities, and at proper intervals. At first, the food should be bread and milk, boiled rice and milk, soft-boiled eggs, oatmeal gruel, plain rice-pudding, preparations of arrowroot, tapioca and sago, simple meat-broths mixed with crumbs of bread or grated crackers, or in which rice or barley has been well boiled. From this it may pass gradually to a more solid diet; though, until the age of puberty, the principal part of the diet should be milk, the farinaceous articles, and vegetables. Sugar has been thought to be injurious to children. It is not so. If taken moder-

ately, at meal-time, it is wholesome. Lately a new form of chocolate has come into use, called *Kraft-chocolate*, made in Germany. It is prepared with cocoa-butter and comes in small cakes, is easily digested, nourishing, and supplies sweets in a very acceptable and strengthening form.

Whatever be the food allowed to children, it should never be taken in excess; and to prevent this, they ought not to take their meals alone; for they have very keen appetites, and if permitted to do so, they will generally form habits of gluttony. Three or four light meals a day is enough.

Their drink should be *water* simply,— nothing else.

If parents would observe these rules, and enforce them strictly, they would confer blessings upon their children greater than riches. They would send them into the world with health and good constitutions, and would save them from untold misery and an early death. Such a course would evince more love for their children than those weak concessions which allow tea and coffee, and all sorts of food, in quantities to suit, which occasion early disorders of the stomach and bowels, and bring later derangements of the nervous system, with all its regrets and horrors.

Sleep of Children.—During the first period of its existence, an infant sleeps a large portion of the time. This is a wise provision of nature. It withdraws the young child, for a time, from those outward exciting agents, which would too much disturb the nervous system of so tender a being. Whenever a young infant is restless or wakeful much of the time, we may feel sure it has had too much food, or is in some way disturbed by it, or by tight clothes, or that some other cause is giving it uneasy sensations. Do not make the mistake of thinking the child is hungry because it cries.

Its sleep should be the promptings of nature, and should never except in rare instances, be brought about by opiates. It is wrong and sinful for a mother or nurse to put an infant to sleep with an opiate, merely that she may gain time for pleasure, or even for other duties.

The Infant should be kept Warm while Sleeping.—During the first few weeks it should sleep with its mother, especially if the weather be cold. After that, it may be in a cradle or cot. The covering should be warm, but *light*, so as not to press heavily upon its tender limbs. If laid upon its back, the fluid of its mouth and throat may get into the windpipe, and obstruct the breathing, or produce coughing. It is better, therefore, to lay the infant upon its side,—taking care not to produce distortion of the spine or limbs by always laying it upon the same side.

Children should not be allowed to sleep either with the aged or with sick persons. It is not healthful for them to breathe the exhalations from the bodies of such. For a somewhat similar reason, some

kinds of plants, and flowers generally, should be excluded from their sleeping-rooms. Their beds should be so placed as to turn their faces away both from the sunlight which comes in at the windows, and from the artificial light in the room.

They should be taught to retire early at night, and to rise immediately after waking in the morning. This habit will be worth much to them through life. Do not form the habit of rocking the child to sleep. After the meconium has passed, the bowels of an infant should be opened from two to four times in twenty-four hours. If the stools are less frequent than twice a day, or, if they are lumpy, some gentle cathartic is called for. From one-quarter to one-half-teaspoonful of castoria, or a dessert-spoonful of mixture (24), answers a good purpose. During *childhood*, the bowels should be moved once or twice a day. When a cathartic is required, a table-spoonful of mixture (25), or a teaspoonful of (17), will be found excellent.

Exercise.—During the first few weeks of an infant's life it requires but little exercise; indeed its organization is not sufficiently settled and compacted to permit much without injury. A little gentle rubbing with the hand over the whole body is about all it needs or will bear. To dandle and toss it about, and especially to set it upright, is injurious and wrong. Its bones are all soft, and will not endure to be much twisted about, and its spine is not stiff enough to bear up the weight of its head.

After a few months, riding in a carriage, by a careful and trusty nurse, is both a healthful and pleasurable exercise for children.

Learning to Walk.—At the end of the ninth or tenth month, a child may begin to learn to walk. It is not safe to teach it this exercise much earlier than this, as the bones, being soft, may be bent by the weight of the body, and the limbs be permanently deformed.

As soon as the child has learned to walk alone, it should be allowed perfect freedom of exercise. Thenceforward, the open air is its proper place during the day; and such an unrestrained use of its limbs as its own instincts may dictate, is its proper calling. For five years after it has learned to walk, it should do little else than to use its limbs out of doors, as it pleases. The books and the school-room will be in season after that. First compact the body, then bring out the mind. The mind is of no use without the body,—the body must be developed first, or never.

Moral Treatment.—We charge upon nature many of the bad passions which we ourselves implant in children. The moral treatment of children is generally bad. We are apt to begin by either making them our masters or our slaves. Sometimes we do both,—allowing them to govern us for a time, and then, getting into a passion, or a mood for playing the tyrant, we turn upon, and govern them as if we were autocrats. We submit to their whims until we

grow irritable, and then, by way of retaliation, we compel them to submit to ours.

This is all wrong. Children should be *governed always*, but with an even, a gentle, and a loving hand. They should early be subjected to habits of self-control, and of regularity in eating and sleeping; and should be taught absolute and continued obedience. All this can be brought about only by firmness, self-control, and great gentleness on the part of the parents. If they would make a child cheerful and happy in its disposition, they must themselves be cheerful, and never let it see anger, passion, and fretfulness, marring their conduct. Nothing is more injurious to the health of a child than a peevish, complaining, and soured disposition; and these vices are seldom acquired, unless seen in the lives of parents.

How to Nurse Sick Children.

As the education of the young, whether religious, moral, or intellectual, is more important than that of adults, so is the care of their physical life of more importance. Death aims to "out-Herod Herod," and seeks the life of all infants, male and female, and in fact destroys one-half of all below the age of five years.

But few know how to train and take care of children. It is a still more rare gift to know how to nurse them when sick. No person can properly nurse sick children who is in feeble health, or has a fretful temper, or is low-spirited: for she can neither endure the fatigue, nor bear the trials, nor hear the prattle which such a responsibility would bring. Some will manage a well child very well, who are not fit to have the care of a sick one; for there is a great difference between a child when well, and the same child when sick. When well, and full of fun and frolic and life, laughing and jumping and shouting aloud for very joy at being alive, it is an easy thing for a person of even a morose temper to attend upon them. But when sickness comes, and the child's playfulness is all laid aside; when it becomes so fretful that nothing goes right with it; when it cries to be laid down, and then cries to be taken up; stretches out its hand for drink, and pushes away the cup when it is presented,—apparently made more angry by your attempts to serve it;—when these things are repeated day and night, until the nurse is weary and exhausted, and even a change of disease and amendment only brings a cross and fractious temper, it is only by possessing peculiar qualifications that the nurse can maintain an even and unruffled disposition.

While passing through such scenes, it is hard for the nurse to remember that sickness does not destroy the little loving heart, but only hides its affection for a short time.

Signs of Disease in Children.—It is important that the nurse of sick children should know what to observe, and the meaning of the signs of disease. A baby has only cries to express its sick feelings. To one person, these cries mean no more than that the baby has *some*



No. 1
PROPER POSITION FOR BOTTLE-FED BABIES.



No. 2
PROPER WAY OF CARRYING THE BABY.



NO. 3
PROPER WAY OF PLACING BABY IN THE TUB.



No. 4
APPLYING THE BINDER.



No. 5
APPLYING THE DIAPER.



No. 6
PROPER WAY OF TAKING BABY'S TEMPERATURE.



No. 7
PROPER WAY OF GIVING ENEMA.



No. 8
WEIGHING THE BABY.

sort of illness. To another, with more experience and better powers of observation, they point to the head, or chest, or stomach as the disorder. A baby with the stomach-ache utters *long, loud, and passionate cries*, and *sheds tears plentifully*. Suddenly it stops for a moment, and then begins again, drawing up its legs to the stomach, and as the pain passes off, stretching them out again, and with many sobs, passing off into a gentle sleep.

If there be inflammation in the chest, it *neither cries loud, nor sheds tears*, but after every long breath or hacking cough, it *utters a short cry, which is cut off before it is half finished*,—apparently because crying is painful.

If the disease be in the head, the cries will be *sharp, piercing shrieks*, with *low moans and wails between*. Or, there will be quiet dozing, interrupted by startling pains.

When a child is taken ill, whatever the disease which is impending, there is always a change of some sort, which soon attracts attention. It either loses its appetite, or is fretful, or soon tired, or sleepy, or restless, or thirsty, or has a hot skin, or, rather, has a number of these symptoms. It vomits, or is purged or bound in its bowels. It loses its merry laugh and cheerful look; it no longer watches its mother's or its nurse's eye, as before, but clings to her more closely, and will not be out of her arms a moment. If lulled to sleep in her arms, it wakes immediately on being placed in its cot.

Such symptoms often continue a day or two before it can be determined what disease is impending. An intelligent nurse may do much toward solving the question. It is frequently proper at such times to place the child in a warm bath. When stripped for the bath, it should be carefully examined to see if there is any rash upon its body. If it be a rash from which it is about to suffer, the bath will help bring it out. The rash should be looked for at least every twelve hours, until the nature of the disease is determined.

The Appearance of the Different Rashes may be distinguished with a little care and experience. Measles has a number of dark-red spots, in many places running into each other, and is generally seen first about the face and on the forehead, near the roots of the hair, and is preceded by running at the eyes and nose, and all the signs of a severe cold. Scarlet fever does not show separate spots, but presents a general bright red color of the skin, much like a boiled lobster. At first there is more of it about the neck and chest than on the face, and it is preceded by a sore throat. Chicken-pox is attended by fever, but not so much running at the nose and eyes as in measles, nor is there so much cough. The spots, too, are smaller, and are not so much run together; and they come out more over the whole body. They appear a few hours earlier on the body than elsewhere; and in a day or two they are found to be enlarged, and turn into little bladders of water as big as the head of a shawl-pin. (See table of comparison of these diseases.)

And now a few Words as to what should be Done in the sick-room of a child. The room should be kept *cool*, and its temperature should be measured by a *thermometer*. This instrument, when hung away from the fire, should show a temperature of about 60°. That is about the right degree of warmth. Sick-rooms are generally kept too hot. The room should be *darkened*; not made totally dark, but its light shaded down by closing the outside blinds, or by dropping the curtains, so as to give a kind of twilight; and the cot should always be so placed as to turn the little one's face away from the light. The room should be kept *quiet*; and this requires attention in the whole house, as well as among the persons in the room. Those present should never whisper, but speak in low and gentle tones,—should not walk on tip-toe, but move about carefully. There is a *fussy quietness* which disturbs the sick far more than noise. The child must be spoken to, and roused from its slumbers, and turned from side to side, and raised for its food or medicine, with a soothing tenderness, and a delicacy which never forgets itself.

Sometimes sickness and vomiting, from which a child may suffer, are increased by want of judgment in giving food and drink. When there is nausea, the stomach will bear only very small quantities of food at a time, while cold drinks are almost always borne much better than warm. When there is nausea, it is best, for an hour or two, not to attempt to give any food or drink. After the stomach has been thus completely rested, give a single teaspoonful of *cold* water. If this is not thrown up, it may be succeeded, in ten or fifteen minutes, by a second or a third. If this is borne, give a little water thickened with isinglass, or cold barley-water, or cold milk and water; and then, with the same precautions, and in very small quantities, beef tea, or chicken broth, or whatever else the doctor in attendance may direct. The smallness of quantity, the coldness of the articles, and the giving it without moving or disturbing the child, if possible, are the important points to be attended to.

A child much exhausted by diarrhœa, or other disease, should be moved or lifted out of its cot or cradle as little as possible. Suddenly moving it when very weak may cause fainting, or even convulsions. Let it be sponged and cleaned by merely turning it, with great gentleness, from side to side.

Marasmus.

MARASMUS, or infantile debility, is a condition which occurs when a child is unable to absorb nutrition from its food. The exact cause is unknown and usually there is some deeper seated trouble present to account for marasmus, which is really a symptom in these cases.

The debility is extreme and an atrophy or shrinkage of all portions of the body excepting the bones occurs. Practically speaking, the

disease is one of auto-starvation and in many cases the only symptom present is the continued diminution of weight, which is progressive and death may result.

Treatment.— The treatment is by proper food, which consists of modifying cows' milk so that the child may take a weak food suitable to its needs where it would be unable to absorb ordinary milk. See articles on food for infants.

Neglect of Baby's Teeth.

The effects of a defective tooth are not merely the ache. This is only a symptom of the work of poisonous germs multiplying every minute, not only eating away the tooth, but rushing in droves to the stomach to interfere with digestion, dying by the millions and developing poisonous products that lower the vitality of the whole system.

A defective tooth may be either (1) one that is decayed, or (2) one that is unsound in its forming, or (3) a crooked, protruding, crowded tooth. Prevention of these conditions must begin before birth, and must continue as daily vigilance through infancy. The diet of the mother should include milk, whole wheat and other whole cereals, eggs and vegetables, all of which will furnish a liberal supply of lime for the baby.



(1) Profiles Showing the Squirrel Face or Overhanging Upper Jaw. (2) As the Jaws Should Be. Under Shot or Prognathous Jaw. Both of These Defective Jaws Can be Corrected if Taken in Time.

While the first set of teeth are being cut the baby must have the supply of lime continued, at first through the milk and later through the same mineral-supplying foods. Meat has no lime. White flour, barley, farina, cream of wheat, soda crackers, have practically no lime.

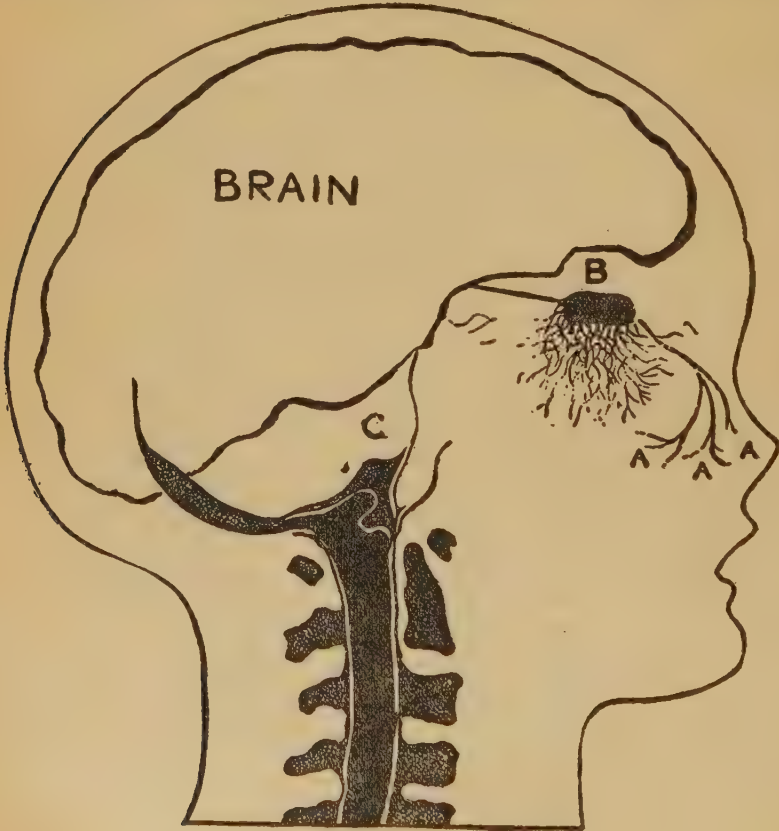
There must also be abundant exercise of the jaws and gums. During the first ten months it is not to be obtained from food. After that it may come from a bread crust, zweiback, a hard cracker or an educator whole wheat teething ring, but these are given only as part of a meal.

The increased circulation in the mouth, jaws and nose and the exer-

cise of muscles that is caused by this munching upon hard substances not only brings the teeth their supply of lime but also causes normal enlarging of these parts so that there is room for the teeth, and the roof of the mouth being normally arched, there is less likelihood of adenoids forming.

Infantile Spinal Paralysis.—*Poliomyelitis*.

The Diagram Shows How the Virus of Infantile Paralysis Makes its Way Through the Nose to the Small Nasal Nerves — A; Thence to the Olfactory Bulb — B; and Travels Thence Through a Part of the Brain to the Spinal Cord, Where it Produces Its Characteristic Lesions.



How to Fight the Scourge.

By Commissioner of Health, City of New York.

(1) Spray the child's nose several times a day with a solution of boric acid and water. Use a "dropper." If the child has sore lips or nose, touch these with dry boric acid powder every few hours.

(2) Any sickness of your child should demand instant medical observation.

(3) The moment you notice suspicious signs of sickness in your child separate him from all other children until medical diagnosis has been made. "Suspicious signs" are fever, digestive upsets (even of mild type), lameness of any joints, or any complaint of weakness.

(4) Remember, infantile paralysis is highly contagious. It can be spread by food handlers, flies and by personal contact with handlers.

(5) Don't let your children use common drinking cups or go to carelessly conducted soda water and ice cream stands.

This disease is now acknowledged to be due to some method of infection, the virulence of which is terrible in its results as the paralysis that follows is rarely recovered from. Although known since 1863 that it was a disease of the spinal cord, yet as early as 1784 the disease was observed. It is, however, within very recent years that it is conceded to be infectious and the great increase throughout the country has caused the State Boards of Health in several communities to require each case to be reported to them so that the study of the disease may be a help toward limiting the numbers liable to infection. The organism has never been recognized, although the damages that it causes to the spinal cord have for some time been noted. At times epidemics have occurred which would seem to be nearing the point that would throw light upon where the disease originated and then a single case will appear so isolated that it seems impossible to determine where the patient was infected. Most of the cases occur in the first three years of child life, although adults can contract the disease and when they do the symptoms are the same as in the young and the changes in the canal, if investigated after death, are similar to those observed in the child. It is rare after the tenth year to find this disease present.

Symptoms.—The disease develops very rapidly. Within a few hours at most, the patient is suffering from high fever and within a day or so in light cases the child may seem to have almost recovered from some indefinite sickness. Later the child will be noticed to be uncertain on his legs, and if made to walk may fall down or stumble. In the more severe types, which are graduated from the moderate one just noted and the fatal ones, death may occur after five or six days; all degrees will be seen. The fever usually ranges from one hundred and one degrees to one hundred and four or one hundred and five degrees, and the loss of motion in the legs, which is more constant than that of the arms, comes on within a few hours in the severe cases rather than after a lapse of four or five days as in the moderate cases. Sometimes convulsions may occur early in the disease and are followed by sleep, the child waking up to go into another convulsion if the disease is progressing. There is usually very little pain apparently present, and if to any extent it is a complication where the nerves of sensation are

affected in connection with those of motion. After a period extending over several months some recuperation of the muscular powers will usually be noted but complete recovery is almost unknown. The parts of the leg in which recovery does not occur soon become lax and flaccid due to the non-use of the parts and care has to be taken that the child in learning to walk does not depend too much upon muscles not affected and cause change in the bones from improper modes of locomotion. As far as death is concerned it is not a common occurrence in this disease which is one of the hopeful sides of a question which is puzzling the medical fraternity so much at the present day.

Treatment.—As the disease is of such short duration in the majority of cases which are of the moderate type nothing beyond general fever treatment is to be recommended. The child should be kept quiet and no disturbing influences allowed in or about the house. Later on in the disease strychnine in small doses should be given for its systemic effect on the body and its stimulant effect on the nerves. The faradic current of a good electric battery systematically applied to the weakened muscles twice a day over a long period of time will help in their nutrition and prevent the atrophy of the muscles which will occur by their non-use. The deformity that may occur, as above alluded to, is treated by braces and supports with corrective apparatus, should the case appear serious. Many months will usually intervene before the real outcome of the seriousness of the disease can be determined.

Inflammation of the Mouth.—*Erythematic Stomatitis.*

THIS is a simple inflammation of the mucous membrane of the mouth, and is very common during infancy. It may be confined to the tongue, or spread over the whole mouth. It is sometimes very severe, going down into the gullet and stomach, and into the wind-pipe. It occasions redness and pain in the mouth and fretfulness of the infant, causing it to quit the nipple suddenly when nursing. A frequent result of this inflammation is the secretion and exudation upon the surface of a white, matter-like curd. It appears in small points and patches. This is the *thrush*, or what nurses call *children's sore mouth*. It is commonly confined to the period of suckling.

Treatment.—The first treatment to be tried in this trouble as well as the next two diseases to be described should be a saturated solution of boracic acid. This is practically a four per cent. solution and it may be made by putting a tablespoonful or so of the powder into a tumbler of water stirred thoroughly and let stand a little while, then pour the upper fluid proportion off, leaving the sediment. This fluid will be of four per cent. strength and may be diluted one-half for use in young

children. After washing your hands wrap a piece of soft linen about the little finger, and after immersing in the fluid gently swab out the mucous membrane of the mouth and cleanse out the upper and under side of the tongue. By following this treatment directly after each nursing the trouble will usually be cured and a recurrence will be prevented. A very good prescription is a teaspoonful of chlorate of potash dissolved in 2 ounces of distilled water. The dose for a child of one to two years would be 15 drops of this mixture diluted with a teaspoonful of water. Older children should have proportioned doses up to one teaspoonful.

Follicular Inflammation of the Mouth.—*Apthae*.

THIS disease attacks the little glands of the mouth, called follicles and appears about the time of cutting teeth. Small white specks, a little elevated, first show themselves on the lips, insides of the cheeks, and under side of the tongue, etc. The specks enlarge, a whitish, curdy matter flows out from their centre, and ulcers are formed, with elevated edges, surrounded by a red, inflamed circle. Sometimes, instead of curdy matter, a bloody exudation takes place, and dark-colored crusts are formed which are mistaken for mortification. In bad cases, there is great restlessness, with hot mouth, dry skin, thirst, and diarrhoea, with green stools, and sometimes salivation.

Treatment.—The milder forms of this disease are treated like simple inflammation of the mouth. If there is thirst, give several times a day, a spoonful of cold water, with a little gum arabic dissolved in it. If the child be weaned at this time, its food should be barley or rice-water, sweetened with white sugar. An occasional dose of magnesia, with or without a little rhubarb, will remove the acid which abounds in the bowels. After ulceration has taken place, borax (274) will do well. When watery discharges from the bowels and griping pains appear, preparation (28) should be used. If the strength be reduced, give (69).

Inflammation of the Gums.—*Gengivitis*.

DURING the cutting of teeth, the gums are apt to be inflamed, red or livid, swelled and painful. The child is languid, with a hot and dry skin, small and quick pulse, little appetite, much thirst, and a tongue covered with a thick, yellowish fur. When ulceration takes place, and is allowed to go on, the teeth become loose, black, and rotten, and often soft and pulpy; a flow of fetid spittle takes place, the breath of the child becomes offensive, and its countenance pale and sallow. The gums bleed under the least pressure, and a profuse diarrhoea fills up the list of ills.

Treatment.—In the first stages, mild washes to the gums, such as (227), will do well. Clear out the bowels at once with magnesia and rhubarb (26). After ulceration has taken place, use oak-bark (232),

or chlorate of potash tablets, or diluted hydrochloric acid (233). A daily tepid bath. If the strength be reduced, use an infusion of Peruvian bark, or quinine (69).

Gangrene of the Mouth.—Canker.—*Cancrum Oris.*

THIS disease attacks weakly children, of a lymphatic temperament, and having inflamed gums. It often follows intermittent, remittent, or bilious fever, and is also frequently connected with disease of the stomach and bowels.

Symptoms.—It is attended with languor, listlessness, indisposition to play or move about, thirst, loss of appetite, peevishness, and inability to sleep. The countenance is pale and sunken, and there is a peculiar puckering of the cheeks about the corners of the mouth. The breath is bad, the gums have the appearance of salivation, the teeth become loose and fall from their sockets, or, if they remain, they become covered with a thick coating of a dirty white or ash color. A few ash-colored water-pimples appear upon the gums, which enlarge, run together, and finally break,—presenting a black appearance of mortification. The gangrene, sooner or later, goes to the lips and cheeks.

Treatment.—When bowel complaints exist, they are to be treated with the usual remedies, such as (70) or (156). If there be active inflammation of the gums, a wash of oak-bark (232) will be in place, with quinine given internally (69) to ward off the mortification. As a wash, too, a strong solution of sulphate of copper (234) is excellent; so is white vitriol (235), and solution of argyrol (219), and creosote (236).

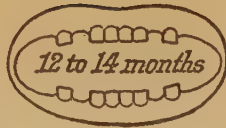
The diet should be beef-tea, plain beef or mutton broth, with rice, milk and rice, tapioca, sago, and the like.

Difficult Teeth-Cutting.

TEETH-CUTTING generally begins between the ages of five and seven months. It is indicated by redness, heat, and tenderness of the gums, an increase of saliva, and, occasionally, redness of the cheeks, watering of the eyes, thirst and fever, with fretfulness, disturbed sleep, and more frequent motions of the bowels, a little more fluid than usual, and sometimes of a greenish hue. As the tooth comes near the surface, the child holds its fingers in its mouth and presses the gums harder upon the nipple when nursing. Besides these milder symptoms, there are sometimes ulceration of the mouth, gangrene, extensive and long-continued diseases of the bowels, and even disorders of the brain, convulsions, and palsy.

Treatment.—Watch the gums, and the moment they are swollen

Growth of the Teeth.



by the teeth pushing them up, lance them at the elevated points, cutting entirely down to the advancing teeth,—so that no tough membrane shall cause pain by impeding their growth. These incisions often prevent fatal disease of the brain, and sometimes almost instantly relieve the most threatening symptoms. Before the teeth are far enough advanced for lancing, some soothing wash may be applied to the gums, as tincture of myrrh or paregoric. For obstinate diarrhœa, with watery stools and griping, use prescription (157). If the child is drowsy and starts from sleep, and has heat and redness, with enlargement of the blood-vessels about the head, put ice-bags behind the ears, and make cold applications to the head. At the same time, open the bowels with castor oil (17). When there is difficulty of passing the water, give flax-seed tea; and if the pain is considerable, a sedative (351); one-half teaspoonful in as much water, every hour till quiet.

Croup.

THIS is one of the scourges of childhood. Croup is an inflammation of the mucous membrane of the larynx and windpipe. It causes a peculiar fluid to flow out upon the surface of the membrane, which stiffens into a membrane, or skin-like substance and adheres to the inner surface of the windpipe, and sometimes extends through the whole of the bronchial tubes. This is *membranous* croup,—the worst and most fatal form of the disease. The ordinary form of croup consists in a congestion of the vocal chords with œdema and swelling, so that the voice is very husky and the cough very much like a hoarse, tight bark. This form is the result of cold, and is usually quickly amenable to treatment, although it is really quite frightful for parents to hear.

The Symptoms of croup are, difficulty of breathing, hoarseness, and a peculiarly loud and ringing cough, with fever. In the membranous and worst form of the disease, the breathing is not, at first, so laborious, and the symptoms generally not so violent and alarming as in the less fatal but more inflammatory type. This latter kind, though generally causing great alarm, like a highway robber, by the sudden fierceness with which they seize the throat, are yet much less fatal, and of course less to be feared, than the membranous form. The disease is pretty much confined to children between the ages of one and eight years.

Treatment.—The mild and ordinary form of croup, so frequently experienced by young children at night time, is usually much alleviated by small, oft-repeated doses either of the syrup or of the wine of ipecac, say five drops (for a child two years old) every fifteen minutes, till nausea, and even vomiting ensue, then much less often. The inhalation of steam, and of many of the medicated vapors, is an

excellent method of treatment for the older children. One teaspoonful of the compound tincture of benzoin in a bowl of boiling water inhaled through a tin funnel is a very simple thing and a very efficacious one; this is to be repeated every twenty minutes. In cases which do not yield to this treatment at once, the employment of turpeth mineral, in one-half to one-grain doses every half-hour till the child vomits, will clear up almost any severe case. The accompanying bronchitis which often follows is to be treated as laid down for that disease. Membranous croup is in reality diphtheria, and is to be so treated, the exudation being in the windpipe rather than in the throat. As soon as the case is diagnosed, the child is to be quarantined in a room by itself, and all the precautions taken against spreading the disease that would be employed in diphtheria proper. The newly-discovered antitoxin, with which the world has now been blessed for a year or two, has already saved hundreds and thousands of lives by its timely use. Nothing is simpler, nothing more efficacious, and nothing less deleterious. (See Diphtheria, page 533.)

The inhalation of the vapor of water-slacked lime softens the membrane and causes the little one to breathe with more ease. Place a bucket under a tent made with a sheet spread over the crib, into this bucket put a piece of lime the size of a turnip, and gradually add a little water. The fumes produced are not hard to bear, but an adult should also get under the tent, so that the little one will not be frightened. Keep the room warm, with plenty of moisture in the air. Liquid diet which is very concentrated, like beef-extracts, milk and egg, etc., with stimulants, should be given every two hours. Support the strength and heart by simple tonics like quinine, one-half grain in powdered sugar, or in a tiny pill, every two hours.

Spasm of the Glottis.—*Laryngismus Stridulus*.

THIS disease consists in a sudden shutting up of the glottis, or passage to the windpipe, which creates a feeling of strangulation, and a difficulty of breathing so great that the drawing in of the breath causes a peculiar crowing sound. There is no fever. The child, upon taking food or drink, or upon being irritated or teased, is taken suddenly with an impossibility of drawing in its breath. After struggling convulsively for a time, its head thrown back, its nostrils dilated, its mouth open, its eyes rolled up, its face pale, its legs and arms stiff, it begins to breathe with a shrill crowing sound. The disease is sometimes mistaken for croup, and for whooping-cough. It is strictly spasmodic in its nature.

Treatment.—During the paroxysm, set the child in an upright posture, with the head leaning forward, exposed to a full draft of cool, fresh air, and sprinkle cool water upon the face. Let nothing be tight about the neck. Slap the child slightly on the back, and apply friction along the spine. If these means do not succeed, place

it in a warm bath; while in the bath, sprinkle cold water on the face.

When the fit is over, examine the gums. If they are swollen, lance them down to the coming teeth. The bowels should be moved daily with some gentle physic, but not irritated by severe purging. If the stools are light-colored, use the following prescription: Podophyllin, one-half grain, alcohol, one ounce, elixir, one ounce, and take a teaspoonful in a teaspoonful of water, three times daily.

Whooping Cough.—*Pertussis*.

THIS is a contagious disease, peculiar to childhood, and occurring but once in the same individual. It is characterized by a convulsive, paroxysmal cough, which is attended by long-continued hissing, convulsive breathing, with rattling in the windpipe, which is succeeded by several short efforts to expel the breath, following each other in quick succession. The long, convulsive breathing, attended by the whooping sound, is immediately repeated; and these paroxysms continue until a quantity of thick, slimy, ropy mucous is thrown up, by expectoration or vomiting, when the breathing is again free. These paroxysms have all the appearance of impending suffocation, redness of the face, shedding of tears, sweating about the head and forehead, and such agitation of the whole body that the child lays hold of something for support. Blood sometimes starts from the nostrils, and the child involuntarily passes water or evacuates the bowels. In spring and autumn the disease most prevails. It is not generally dangerous.

Treatment.—First give an emetic,—say, two drams of wine of ipecac. Afterwards, given small doses of ipecac and sulphur (277). From six to fifteen grains of sulphur alone, three times a day, is an excellent remedy. A liniment of olive oil, oil of amber, etc. (193), applied to the spine, is useful. Belladonna (278) is a good remedy. Prussic acid (96) is strongly recommended by many, and is worthy of a trial. Ipecac (106) is a valuable remedy. Alum (279) is well recommended. Sulphuric ether, a little being spilled in the nurse's hand and held to the child's nose, generally shortens the paroxysm, and frequently abridges the disease.

There are remedies by the legion that have from time to time been used against whooping cough, but few of them have survived their infancy. Among the more modern drugs bromoform still holds a prominent place. Given in one to six-drop doses in a tablespoonful of water, three times a day, and gradually increased to five and ten drops, respectively, the drug exerts a marked impression on the

duration and severity of the disease. Antipyrin, in five- to ten-grain doses, according to age of child, given three or four times daily, mitigates the paroxysm and shortens the disease. The burning of cresoline, a coal-tar product obtainable at all drug-stores, is a most valuable means of cutting short the disease. This liquid should be put in a tin box-cover and set over a lamp with very small blaze,—just sufficient, in fact, to evaporate the cresoline. A lamp for the purpose comes with the cresoline, but any ordinary lamp with serrated lamp-chimney may just as conveniently be used. The odor is strongly tarry. The vapor should be confined in the sleeping chamber at night, but may also be burned both night and day.

Looseness of the Bowels.—*Diarrhœa.*

INFANTS and children are more liable to diarrhœa than adults, and this is the reason for speaking of the disease here as well as elsewhere. It may be caused by inflammation of the stomach and bowels, by irritation produced by too much or improper food, by cold and damp weather, or by teething. The discharges from the bowels may be more or less thin, of a dirty white color, of a curdled appearance and acid smell, or they may be watery, yellow or green in color, and often mixed with blood. Sometimes they are mixed with portions of undigested food, are very acid, and when the looseness has been caused by unripe vegetables and fruit, in a state of fermentation, like yeast. At other times, especially while teething, they are a kind of thick mucus, like jelly.

If pressure on the bowels causes pain, the diarrhœa is the result of inflammation. When the disease has become chronic, the skin is dry, harsh, and discolored, the face wrinkled, looking yellowish, dirty, and old.

Treatment.—First, regulate the diet. This is very important. In the case of older children, take away every kind of solid food, as well as pastry, confectionery, sweetmeats, and fresh vegetables. Give plain boiled rice and milk,—sometimes boiled milk,—water gruel, crackers and milk, tapioca, etc. At the beginning of the attack, give some mild physic, as castor oil, or syrup of rhubarb. A warm bath at this period is excellent. If the discharges are very sour, dissolve a teaspoonful of bicarbonate of soda in half a tumbler of water, and give a teaspoonful every hour, or the same amount of lime-water, mixed with an equal quantity of new milk, or prepared chalk and ipecac (158), some slight astringent being used also (159).

After cleaning out the bowels in the way recommended above give a one-fourth teaspoonful for a child five years old of a mixture which may be obtained at the druggist containing 2 drachms of the subgallate of bismuth, 20 grains of salol in 2 ounces of compound chalk mixture.

The Summer Complaint of Infants.—*Cholera Infantum.*

THIS is confined to the North American continent. It occurs in large cities during the hot season. Its subjects are infants between the ages of four and twenty months,—occurring most frequently about the time of cutting the first teeth. It is one of the most fatal diseases of infants.

Symptoms.—It begins with a profuse diarrhoea,—the stools being green or yellow, or more often light colored, and very thin. The stomach soon becomes very irritable,—rejecting everything with violence. In some cases, vomiting and purging set in,—the discharges from the bowels being without color or smell. The infant rapidly loses flesh, and is soon reduced to great languor and prostration. The pulse in the beginning is quick, small, and often tense. The tongue is covered with a white, slimy mucus. The skin is dry and harsh. The head and belly are hot. The feet and hands are either of the natural temperature, or cold. There is great thirst, and towards evening, fever. The belly is often a little swollen, and tender to the touch. Occasionally there is delirium, as indicated by wild and bloodshot eyes, violent tossing of the head, and attempts to bite and scratch the nurse.

Treatment.—If possible, remove the child at once from the impure and heated air of the city to the cooler and purer air of the country. Or better, take it to the seashore or a short trip on the salt water. This will often give immediate relief. Be careful the child does not take cold. If this cannot be done, keep it in as large and dry a room as can be had, and take it often into the open air in clear weather. Confine the infant entirely to the breast, or, if weaned, let its food be tapioca, pure arrow-root, rice flour and milk, and put it daily in a warm or tepid bath, according as the skin is hot or cold. Give it gum-water, or rennet whey, with a little gum-arabic added to it.

These measures, if used early, will often cure the disease, without medicine. If the vomiting be obstinate, camphor and sulphuric ether (280) will generally give relief. The prescription for diarrhoea will be valuable in this disease and in addition some stimulant like whiskey in doses of 5 drops to 30 drops according to age, had better be given every 3 or 4 hours. When the vomiting is stopped, the most prompt remedy for the disordered bowels is the compound syrup of rhubarb and potassa. When the disease has become chronic, treat it the same as children's diarrhoea. But if the discharges are sour, offensive and dark colored, pulverized charcoal (42), with tartrate of iron (71), will be suitable remedies. Rhubarb, leptandrin, etc. (28), will often answer a good purpose.

Colic.

INFANTS are very much subject to colic, from over-feeding and

consequent acidity of the stomach, from giving them solid food at too tender an age, and from some improper thing eaten or drunk by the mother or nurse. They often suffer intensely from these pains, tossing their legs up and down, and screaming vehemently. When it arises from costiveness, the bowels are often hard and swollen.

Treatment.—When it arises from costiveness, give an injection of a tablespoonful of castor-oil, and a half-ounce of warm infusion of peppermint or spearmint. At the same time, administer internally an infusion of one of the same herbs, with a small portion of bicarbonate of soda dissolved in it, and sweetened with loaf sugar. Or, if the bowels need to be acted upon, the syrup of rhubarb, or the sweet tincture of rhubarb, with a little soda in it, will do well. Paragoric generally brings relief, but should not be used, if simple carminatives will answer the purpose. Children are often relieved by covering them with a hot flannel, laying them upon the belly on the knee, and trotting them, at the same time tapping them gently upon the back. This should be done cautiously; for if unsuccessful, it might increase the suffering; and the infant has no language but screams to tell its distress. Five drops of aromatic spirits of ammonia, with same amount of spirits of lavender, in warm water, relieve, if often repeated, most cases.

Falling of the Bowel.—*Prolapsis Ani.*

IN cases of long-continued looseness, the lower bowel of children sometimes gets so weakened that it drops down, and projects through the fundament. Occasionally, only the mucous membrane which lines it comes down, in the shape of a small tumor, causing a sense of bearing down and smarting. These fallings-down occur when the child goes to stool. Whether it be the bowel or the lining membrane which has come down, if it be allowed to remain long down, inflammation will take place, and to return it will then be very difficult.

Treatment.—Place the child upon his back, and, having smeared the thumbs, or forefingers, with lard or sweet oil, press them gently upon the tumor in such direction as shall tend to return it within the body. If this does not succeed, push the forefinger into the gut, so as to relax the circular muscle which contracts upon and holds it. If the falling is caused by straining at stool, made necessary by costiveness, some ripe fruit stewed in molasses, or rye hasty-pudding and molasses, should be given to the child daily, and it should be caused to empty the bowels while standing up. To strengthen the bowel, few things are better than cold water, applied to the fundament several times a day. An astringent wash of oak-bark (232) is also valuable. Should the bowel become so much relaxed that these means fail, a tight bandage must be applied to support the fundament. Be careful that some ignorant pretender does not—as has happened—apply the ligature or the knife, and cut off the tumor,

instead of returning it into the body. Feed upon the simplest of liquid food.

Gastric Fever of Infancy.

THE inflammatory affections of the bowels, which happen after teeth-cutting, are frequently accompanied by remittent fever,—the fever showing itself very distinctly towards evening, and subsiding, or nearly disappearing, in the morning. It is a sympathetic fever, and is generally the result of a reaction produced by inflammation of the stomach, or ileum, or colon. The attack is sometimes sudden, though generally gradual.

Symptoms.—For several days, the child will be languid and fretful, with loss of appetite, increased thirst, and some heat of skin. Towards night these symptoms are more intense; the skin is more hot, the thirst and restlessness are greater, the pulse more rapid. In the morning, the skin is more moist and cool, and the child falls into a short, disturbed sleep. Early in the attack, the bowels are constipated,—though there is sometimes diarrhœa, or a frequent desire to go to stool without much being passed. The evacuations are always unnatural and very offensive. They are dark-colored, or clay-like, or of the consistency of tar,—sometimes mixed with mucus, and occasionally with blood. There is tenderness of the belly, and pressure upon it causes pain. It is also hot to the touch, while the feet are cold. The face is flushed, and the breath has a decidedly sickly smell. The stomach is irritable, and vomiting is frequent. The tongue, after a time, becomes coated, dry, and pointed.

In the chronic form of the disease, there is, frequently, diarrhœa, the passages being unhealthy and fetid; the tongue is covered with a brownish-yellow mucus, the gums with sores; the lips are parched and cracked; the urine is scanty and high-colored, with a white sediment; the skin, dry, harsh, and dirty-looking; the countenance contracted and wrinkled; and there is, frequently, a dry, hacking cough.

Treatment.—Regulate the diet. This is important. In recent and acute cases, withhold all food, except some cold mucilaginous fluid to drink, as rice-water, gum-water, infusion of slippery-elm bark, or milk diluted with barley-water. Give a warm or tepid bath daily. Purgatives should be used *sparingly*. The bowels, when costive, had better, generally, be opened by injections of tepid water, or thin gruel. If any laxative be used, let it be the compound rhubarb powder, or either of the following (28), (281). When the discharges have become healthy, and the tongue clean and moist, some light bitter, as the infusion of Peruvian bark, or calumba, in combination with diluted sulphuric or hydrochloric acid, may be given. These, carefully given, with the daily tepid bath, and exercise in the open air will soon restore the strength.

Mesenteric Disease.

THIS attacks scrofulous children between the ages of three and ten years. Its symptoms are a prominent belly and loss of flesh,—particularly upon the arms and legs. To be able to feel the enlarged and hardened glands through the walls of the belly is the surest sign of this disease. When the complaint is long-continued, the child loses all its flesh, and dies in almost a complete skeleton state.

Treatment.—If there is inflammation or other disorder in the stomach or bowels, attend to this first. Then put the patient on a generous diet, such as meat-broths, etc. Give bicarbonate of potassa, dissolved in the infusion of calumba or quassia, and when there is costiveness, add rhubarb to the preparation. For the enlargement of the glands, apply, externally, an ointment (184) of the iodide of lead, or of the iodide of potassium (185). Give an ioduretted bath, daily, which is formed by adding one grain of iodine and two grains of iodide of potassium to each gallon of warm water.

The syrup of iodide of iron, three to five drops, should be given internally three times a day, in a little water, or the iodide of potassium, five grains, and compound infusion of gentian one-half teaspoonful. Daily sponging the body in salt water, and exercise in the open air, are important.

Rickets.

THIS is also a disease of scrofulous children. By some defective process of nutrition in such children, there does not enter into the bones enough phosphate of lime to harden them, and the weight of the body, or the pulling of the muscles, or the pressure of the clothing, bends and distorts them in all manner of ways. The heads of the thigh-bones are pushed nearer together, making the lower belly narrow; the backbone is so curved as to lessen the height; the shoulder-blades stand up like wings when flying is contemplated; and the shoulders are so lifted up that the head seems only a little higher than the elevations on each side.

Treatment.—A good, generous, wholesome diet, properly regulated; out-door exercise; the tepid or cold salt-water sponge-bath, with friction, and but little medicine. The hypophosphite of lime, in two-grain doses, given in a little sweetened water, three times a day, or the syrup of the hypophosphites, in half-teaspoonful doses, three times a day, may be given with advantage. The pyrophosphate of iron, combined with the lime, makes a good tonic for scrofulous children.

The Blue Disease.—*Cyanosis*.

THIS disease is known by a blue, purple, or leaden tinge over the

whole body. The warmth of the body is reduced, there is difficult breathing, which is increased by quick motion or by crying. The disease is generally fatal. The blueness is occasioned either by the passage between the right and left side of the heart remaining open after birth, so as to let the blue, venous blood run through and mix with the red arterial blood, thus making the whole blue, or by the obstruction of the pulmonary artery, which withholds the blood from the lungs, and does not allow it to be arterialized and reddened. This latter opinion is the more general one now.

Treatment.—Keep the patient, as much as possible, in a state of rest, so that the circulation may not be hurried. Allow pure, fresh air, easily-digested food, and protect the body from cold and dampness. Hold the infant near the fire, and apply gentle friction over the head and body with a warm, soft cloth.

Fits.

MOST persons have seen a baby in fits; and it is a sad sight,—its little face all distorted and livid, its eyes rolling and squinting frightfully; its hands clenched, arms bent, legs drawn up, body arched backward, and limbs twitching violently,—itself insensible and unable to see or swallow or move. After a time, the fit ceases, sometimes by degrees, at other times suddenly, the child fetching a deep sigh, and then lying quiet and pale, as if it had fainted. From this state it passes into a sleep, and, on waking, some hours after, seems quite well.

Fits may attack a child which is apparently well, occurring daily, or even several times a day, and it may linger on for weeks. A child may have fits from a great variety of causes; they therefore, have a different meaning in different cases. But they *always* show that the brain has in some way been disturbed.

Treatment.—As fits are not a disease in themselves, but only a *symptom* of some disease, the treatment must have reference to the cause. Sometimes, while the fit lasts, it is wise to do nothing. But, if a fit come suddenly, in the case of a child previously healthy, it is generally safe to place it in a hot bath, and at the same time to dash cold water on its face, or to pour cold water on its head, or hold on it a large sponge dipped in cold water. The hot bath will draw the blood to the skin, and away from the overloaded brain. It will quiet the disturbance of the system, and if scarlet-fever or measles are about to appear, it will bring them out.

Birthmarks.

A BIRTHMARK is a defect in the topmost layer of the skin. Attempts to remove them by burning with acids or mechanically are dangerous. Skin Specialists claim they can most unsightly Birthmarks by applying Frozen Carbonic-acid Gas, that it does not burn into the other layers of the skin, but merely removes the defective top layer allowing it to renew itself normally after the renewal.

Stammering.

As to the factors which cause this affliction, very little is known. It is safe to say, however, that the cause of stuttering is comparable to that of the disease of the nervous system.

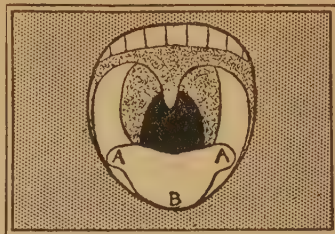
Care and help by the parents and teachers of these unfortunates (especially those of school-age, between four and fourteen years) are absolutely necessary. Neglect at this time is inexcusable.

When the child commences to stutter, check him at once. Insist on this and when his mind is at ease invite him to tell slowly what he wishes to say. Remember that the more a person stutters, the more he is prone to stutter. Stammering and stuttering soon become habitual. The habit may certainly be checked if treated properly. Correct breathing exercises are very essential to its cure.

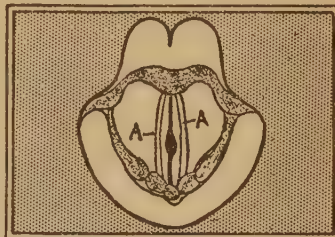
The phonetic drill necessary to improve the stutterer is the same as that employed in teaching the beginner to read. Particular stress should be laid on the use of the consonants l, d, t, k, c (hard), p, g (hard), w, th and sh.

The vocal gymnastics must be repeated slowly and frequently in regular fashion. Rhythmic gestures while speaking alleviate the effort.

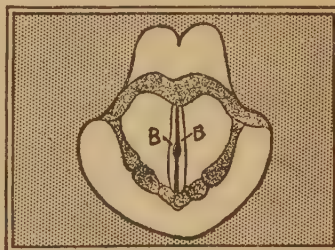
Whispering and singing practice in place of talking assist in the cure.



AA—Indentations found in Tongue of a Stutterer. B—Shrunk Tongue.



View of Normal Larynx and Organs of Speech. AA—Normal Vocal Cords.



Larynx of Stutterer, Showing Wasting Away Caused by Defective Nerve Supply. BB—Shrunken Vocal Cords.

Danger of Infection in Eruptive Fevers.

PARENTS and those coming in contact with the Eruptive fevers, so called, are naturally interested to know how long it will be after a person is exposed to infection before the disease will make its appearance, and also for how long a time a person afflicted with the disease remains a source of contagion. For this purpose we have prepared a table showing the period of "incubation," as the time between contact with the disease and its appearance is called, and other important points to remember.

Name of Disease.	Period of Incubation (from Time of Exposure).	Rash Appears.	Character of Rash.	Rash begins Fading.	Disease Contagious.
Measles; Rubeola.	One to two weeks.	Fourth day of fever.	Small red spots like flea-bites; first appearing on temples and forehead.	From four to seven days.	Six to ten days after rash fades.
Scarlet Fever; Scarlatina.	One to six days.	Second day of fever.	Bright scarlet, spreading rapidly; first on chest and upper extremities.	From three to five days.	As long as peeling lasts.
Rubella; German Measles	One to three weeks.	First day of fever.	Like Rubeola but less distinct.	From four to six days.	As long as peeling lasts.
Variola; Smallpox.	One to two weeks.	Third or fourth day; pustules sixth to ninth.	Red spots; becoming successively pimples, vesicles, and pustules.	Scabs begin to separate at end of second week.	So long as crusts re-form.
Varioloid.	One to two weeks.	Third or fourth day; pustules sixth to ninth.	Red spots; becoming successively pimples, vesicles, and pustules.	Vesicles begin to dry up in 5 to 9 days.	So long as crusts re-form.
Varicella; Chickenpox.	Usually about two weeks.	Within 24 hours.	Pink pimples, becoming vesicles; first about nose.	In three or four days; drying up without pus forming.	So long as crusts re-form.
Typhoid Fever.	Ten to fourteen days.	Seventh to fourteenth day.	On trunk only. Pink spots, few in number.	Persists as long as disease.	Throughout disease.

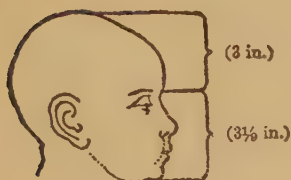
Infection in Other Contagious Diseases.

Name of Disease.	Period of Incubation (from time of Exposure).	Manner of Transmission.	Character of Symptoms.	Disease Contagious.
Cerebrospinal Meningitis.	Two to ten days; commonly seven.	Contact with Catarrhal Secretion through coughing or sneezing.	Sudden onset with severe headache, stiffness of neck and vomiting; temperature 102°; pulse slow.	So long as cultures from nasopharyngeal region are positive. May be three months or longer.
Diphtheria.	Two to five days.	Contact with discharges from another case, fomites, or through milk or milk products.	Onset insidious; fever low, 101°-102°; characteristic membranous patches over throat, tending to spread rapidly.	So long as discharge occurs. "Carriers" may be infectious for months.
Erysipelas.	Within twenty-four hours.	Inoculation by a special pus germ.	Usually occurs on face or neck as a bright red, polished spot, with well-defined margins, lasting four to eight days.	Until scaling off ceases.
Mumps.	Four to twenty-five days; usually fourteen days.	Direct contact with case or articles freshly soiled with secretions of mouth or nose.	Pain on opening mouth, chewing or swallowing; enlarged parotid gland in front of and below ear on one or both sides.	Unknown; probably until parotid gland returns to normal.
Poliomyelitis.	Three to ten days, commonly six days.	Direct contact with case or carrier; indirectly, by contact with articles freshly soiled with virus.	Onset resembles common fevers of children or Meningitis; paralysis of lower extremities comes on in one to seven days in 75% of cases.	Unknown; apparently not more than twenty-one days from onset of disease.
Whooping Cough.	Within fourteen days.	Direct contact with cases or articles freshly soiled by discharges.	Onset with catarrhal inflammation of the nose and bronchitis three to fourteen days before characteristic whoop develops.	Most contagious in early stages before whoop has developed; lasts two weeks after whoop.

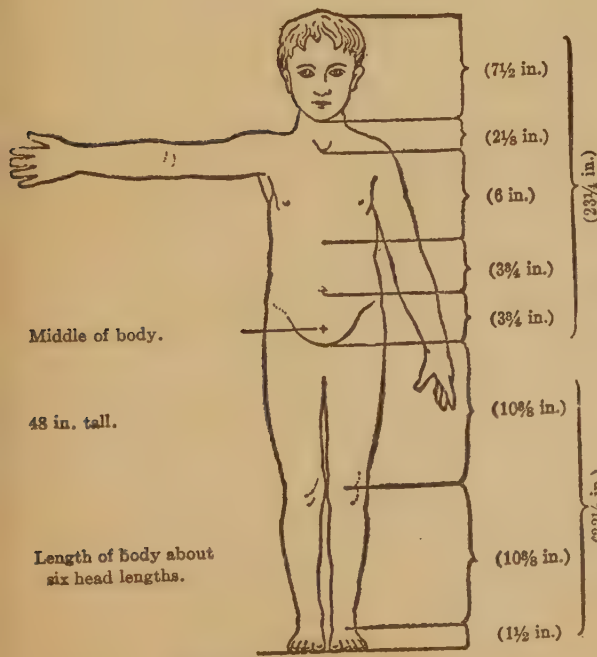
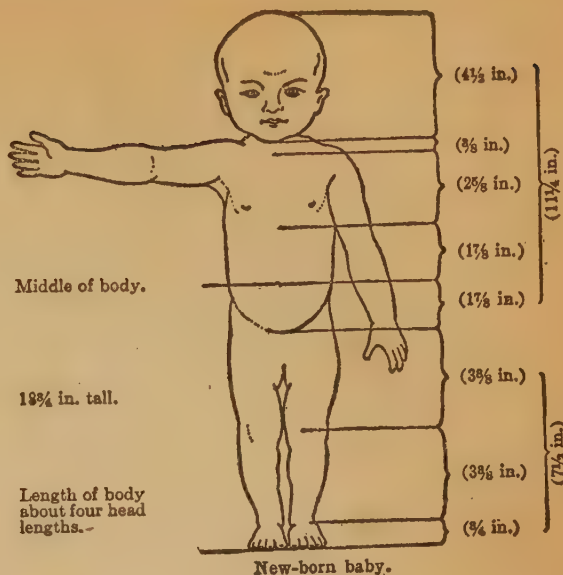
PROPORTIONS OF A HEALTHY CHILD'S BODY.



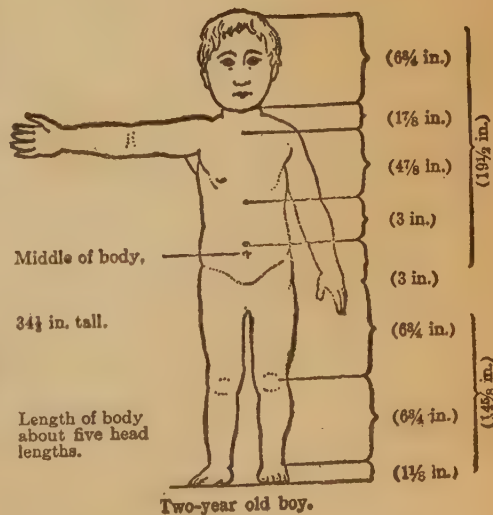
At birth.
Length of head 4½ in.
Length of face about half the length of head.



At age of one year.
Length of head 6 in.
Length of face from one-thirteenth to one-twelfth larger than top of head.



Boy five and a half years old.



Two-year old boy.

DISEASES OF THE GENERAL SYSTEM

AND MISCELLANEOUS DISEASES.

HAVING now treated of those disorders which affect the skin, the brain and nerves, the throat, the lungs and their appendages, the heart and its covering, the abdominal cavity and its lining membrane, the sexual organs, and those complaints peculiar to females and children, it remains to speak of those others—fewer in number—which are not specially developed in any particular part, but disturb the whole system.

Blood.

Composition of the Blood.—The weight of the blood of the body being 1-13 of the total weight, its examination must necessarily be of considerable importance in the study of disease, and as the examination of the blood in a scientific way is the result of the later year's investigation a short description of the methods employed is here inserted. Though some finer sub-divisions may be made, it is sufficient for our purposes to consider the two kinds of corpuscles which constitute the solid portion and the fibrin and plasma which make up the fluid portion of the blood. The corpuscles are divided into red and white corpuscles, the red being in much greater number, give the color to the blood, their proportion being five million in one cubic millimetre of blood, a c. m. being the standard of measure and is equal to a very small drop. The white corpuscles in healthy blood number about 5,000 to a c. m. Roughly speaking, the human body contains about five to seven quarts of blood in the vessels and the tissues. On making an examination of the red blood corpuscles they are found to vary in disease from one million or even less, to the normal number or slightly in excess of five million. This diminution is found in the so-called anæmias. There are simple and pernicious anæmia and a third blood disease is chlorosis or yellow sickness, in which the corpuscles may not be greatly diminished in number but the coloring matter has disappeared. This coloring matter which is known as hæmoglobin is determined by extracting a small drop of blood from the body, diluting with a mild acid which destroys corpuscles and the resulting shade of color is compared with coloring plates of standard strength. The white corpuscles are divided into three or four important groups, of which the leukocytes are about sixty per cent.

Anæmia.

Causes.—Simple anæmia may occur from a variety of causes and is a very common disease after hemorrhage from the body, as the result of injury, losing an ear, arm or leg, or even wounds that allow the escape of considerable blood before the flow of blood is stopped will result in an anæmic condition of the patient. A serious disturbance of nutrition either from starvation or because the food that is taken into the body does not nourish. The occupation of the patient which may be unhealthy such as working in paint shops or sewers or chemical works or exposure to disease such as malaria.

Symptoms.—Headache, dizziness, ringing in the ear with blurred vision, liability of palpitation, especially under nervous disturbances, general sickness of the body with backache, diminished or entire lack of appetite, gas in the stomach, pain after eating, disturbances of the bowels, usually constipation, pallor of the lips, cheeks, fingernails, and loss of flesh and strength.

Treatment.—If the cause can be found the treatment will be rewarded by a great improvement with its removal and the use of proper blood tonics. Iron and arsenic are the remedies employed to compensate for the loss of coloring matter.

Unnatural articles of diet, if used in excess, often cause a condition of the stomach which will result, if not checked, in chlorosis or green sickness.

Chlorosis.

Symptoms.—The symptoms are practically those of the other anæmias. Heart trouble, such as palpitation, irregular beat of the heart, ringing in the ears are possibly more common than in simple anæmia and the color changes in appearance to a greenish yellow; the patient may seem more stout owing to the swelling of the legs, enclosing a vein when the disease has lasted some time.

Treatment.—If the disease has not been present over too long a time the treatment recommended for simple anæmia will usually be sufficient to obtain a cure. Great care must be given to see that the person has an abundance of easily digested and nourishing food, that they have plenty of air, large amount of rest, and on no account must exercise be carried to the point of fatigue. The preparations of cod liver oil in emulsion if not offensive to the person, and all the fat that can be taken in the form of butter, cream, and milk should be given to those who are thin. Strychnine in 1-60 grain dose three times a day after meals, quinine in moderate doses of one grain after meals and the care of the person, if a young girl, at the monthly period, to prevent cold being taken will all be of value.

Pernicious Anæmia.

PERNICIOUS anæmia is the name given to the third and fatal variety of blood diseases, because no cure has yet been found to limit its onward march. The symptoms are similar to those described under simple anæmia and chlorosis, but no cause can usually be found for them and no cure likewise. Happily the disease is not common and is exceedingly rare in childhood.

Leucocytosis.

THIS is a name given to a condition of the blood where the white corpuscles are increased in amount. In certain blood diseases, of which leukæmia is the best example, the increase is enormous at times, even reaching to 80,000 and 100,000 corpuscles in the same amount of blood that should have only five to six thousand.

The symptoms of this disease are very similar to the anæmias and the diagnosis of the disease could only be made out by a scientific examination of the blood. It is accompanied by swelling of the glands, but as this also occurs in other diseases, their value is not of great importance, but a small increase of the white corpuscles is found in such a great number of more common disease that an examination of the blood is made as a routine measure. In many cases, for instance, in appendicitis the white corpuscles increase to fifteen to twenty thousand per cubic millimeter; in pneumonia they also increase sometimes to forty per cubic millimeter.

In other more common diseases as tonsillitis or sore throat, erysipelas, in small pox, inflammatory diseases such as felon, boils, bone diseases and lung troubles a greater or less increase is always found. In other diseases absence of an increase often enables the right diagnosis to be made out, for in typhoid fever which might in the early stages be mistaken for appendicitis there would be no increase in the formation of the disease but it would probably be marked in the latter stages. In malaria there is no increase but an examination of the individual cells of the blood under a microscope of fair power would discover the organism of malaria which is the cause of the disease.

Bacteriology.

It is now well understood that every specific disease, every communicable disease is due to the introduction into the body of a specific cause of that disease which is called a germ. For example, one variety, a microscopical form of animal life the so-called plasmodium of Laveran, the discoverer, is the cause of malaria. An example of another variety is one of vegetable life in its lower form and the germ of the disease the bacillus of tuberculosis. During the life processes of these germs a poison is formed called a toxin which has a marked influence in the course which the disease runs and in many

instances it is the toxin manufactured rather than the primary onset of the disease which makes the trouble greater or less. The membrane of diphtheria in many instances is not great enough to cause the severe results obtained in this disease and persons die from an attack with relatively little membrane present in the throat. This is the result of the toxin, or poison generated by the germ, and during its circulation through the body causes the fatal result by several paths, one being the paralysis of the nerves so that swallowing is impossible or the heart is not controlled by the nerves that usually act upon it with a control similar to a safety valve. The toxin of tuberculosis is tuberculin. Pneumonia is due to the pneumococcus.

Typhoid fever is due to the bacillus of Eberth, the discoverer. The disease of plague is due to the bacillus of Yersin discovered in 1894. Even now, many diseases, some of the oldest have escaped giving up the secret of their communicability to investigators. It seems strange too, for many of them have been accepted as contagious from earliest times. Take leprosy as an example of a disease known since the world began and yet while we are sure it is due to a specific germ, yet the identical one has never been insolated.

It is necessary to understand methods of prevention of disease as well as the causes and the treatment of them. Only the ignorant, or worse still, those unwilling to believe facts can refuse to accept the record compiled each year of the great decrease in the mortality rate of disease. This it is our duty to prevent transmission of, and that it is due to this prevention in many cases, may well be verified by further reports. For example, the death rate of typhoid is not much diminished in general practice from that of ten or twenty years ago but the per cent. of cases reported annually is much diminished. Of course by newer treatment and quicker methods of diagnosis the comfort of the patient is increased and complications averted, and in that way the patient is carried through the illness with less loss of strength, but it is much better not to have been sick, and since we now understand about the transmission of disease through drinking water, milk, and from foul matter, disease is prevented or stopped after our investigation determines its source. Malaria was formerly very prevalent in Michigan but in ten years the percentage of cases is less than one-fourth. This benefit was due to better draining of swamps, marshes, and stagnant pools, employment of mosquito nettings, and improvement of drinking water service.

Yellow fever is transmitted by the mosquito in a manner identical with malaria.

There has been a great amount of labor expended by our government as well as the medical profession determining how far the cause of malaria is due to infection of mosquitoes. By injecting the organism of malaria in the saliva of the mosquito after a bite of a person by a mosquito, it has been possible to cause that patient to have a true attack of chills and fever, also germs have been

found in the deposit of eggs by a mosquito upon the surface of pools of stagnant water, as shallow wells, ponds without an outlet, etc. The germs are liberated and drinkers of such water acquire the disease.

An example of an entirely different nature in regard to action, but similar in result, is a disease best known of all from the standpoint of its fearful results, and that is tuberculosis or consumption, sometimes spoken of as phthisis.

Now this disease is spread mostly through atmospheric dust which is also true of most of the communicable diseases as diphtheria, pneumonia, influenza, scarlet fever, measles, whooping cough and smallpox, and not only are they contracted through the nose and throat, but are most often *spread* from the nose and throat. It must be explained that the germs of many diseases which are prevalent in the air are often distributed upon mucous membranes of persons not ill with the disease. The more numerous the germs the greater the danger that they will land upon some abrasion of the membrane, or the vitality of the person will be lowered to a degree of so-called susceptibility, which is the term used for the condition when a person is especially liable to contract that disease.

Expectoration is, of course, the great carrier of germs, but coughing, sneezing and sometimes in speaking, little drops of saliva or a fine moist spray are thrown out which contain germs.

Plague is the disease where the infection by this manner causes the glands of the body to be swollen sometimes to a very large size, and until the antidote was discovered there was no cure known after a person had once become afflicted by this disease.

Another method of transference is by rats, either by biting or from fleas which have infested the rats, also flies, conveying by means of their feet germs from sputa, excreta, sores, etc. Probably typhoid has been transferred in this way many times. Tuberculosis of the bowels results from swallowing of saliva or sputum of a patient whose lungs are already infected or from milk or water. Should the milk or water have been boiled, this danger would have been done away with.

Having considered at some length how bacteria obtain an entrance into the body our common sense shows us the way to a prevention of the disease in many of the cases. Stings of mosquito and bites of animals can be guarded against in many instances and when contagious disease is about us we may with more safety keep people from that; but we have got to breathe and our object must be to make the air as pure as possible either by cleansing the air or by

ventilation, changing the contaminated air for pure air, which is the far better way.

And the method of cure as well as prevention is instanced by our efforts in paying attention to the person of the patient as well as the disease. As good soil is necessary for the growth of germs, so we make the soil as poor as possible by building up the patient and assist the tissues to fight the disease as well as to destroy the organisms themselves. So tonics, and general tissue builders, with a few symptomatic remedies to control cough, produce sleep, etc., enable us to obtain the trinity of pure air, good food, necessary rest.

Now a few words on the counteraction of the poisons or toxins by antitoxin either by nature or by man. The help we hoped to obtain when it was thought an antitoxin of consumption had been discovered has not been realized, for it has proved to be more or less of a poison and its results have proved of little value except as a method of diagnosing the disease.

The antitoxine of diphtheria, of tetanus which is lockjaw, that of bubonic plague, and that of septicæmia or blood poisoning have all been proved of great service.

The word antitoxin explains itself, meaning *against poisons*. When the germs obtain a foothold in the system they occur both as the local manifestation, such as the membrane in diphtheria, and the destruction of the lung in tuberculosis and the general manifestation such as the poison I have described. Nature herself attempts to counteract this poison by an antitoxin of her own, but in many cases the amount of antitoxin manufactured is in too great a quantity and the time limited too short for nature to do satisfactory work before the patient would be dead.

So we reinforce nature with antitoxin manufactured by man. With antitoxin of diphtheria as an example I will explain briefly how it is accomplished. The primary object is to inject toxin in quantity sufficient to cause nature to manufacture her own yet by gauging the quantity and increasing the amount gradually until at last a dose can be injected which would have caused death if given in the first place. If no reaction of temperature and no sickness occurs after these large doses, then the animal is said to be immune and the serum of the blood drawn from such an animal is the antitoxin we use.

Malaria being caused by a form of animal life does not require an antitoxin as quinine has been found to be a sufficient drug to cause the destruction of the cause.

Of course smallpox is caused by a specific germ and yet no specific treatment is at present known. Vaccination as you know is a preventive and not a cure. Immunization has been known since 1798 when the first published reports from Jenner to whom we owe the discovery, appeared.

He had noticed that the dairy maids were practically free from smallpox. Then sores were noticed on their fingers which resembled

the sores on the cows. It has not even yet been settled that cow pox is or is not similar to smallpox but with its virulence modified. As a matter of fact smallpox has been given to a cow, but the further fact remains that cow pox does prevent in the human system the disease of smallpox. Formerly vaccination took place through human beings after originally being taken from the cow, but it was discovered that the protective power diminished by repeated transmissions through the human system so that virus obtained from the cow is now used almost exclusively. Formerly the death rate of persons exposed was 50 per cent. of those who took the disease, and about that rate remains today but it will be shown how much less the danger is when vaccination is enforced.

Notwithstanding the fact that it has been accepted by some since 1798 that an immunity has been offered from the disease, yet even today many of the, if I may use the terms, ugliest opponents are intelligent medical men.

Germany made the first laws and in fact she stands alone in enforcing vaccination. In 1871 a smallpox epidemic broke out, and out of a population of 50,000,000 she had 143,000 deaths. In 1874 she made her famous laws of compulsory vaccination and last year with a much increased population she had 100 deaths and these occurred on the towns of the frontier. Another instance was the Franco-German war when Germany with her army vaccinated, lost only 278 by death from smallpox, while France *without* any vaccination laws lost 23,000 men. In those whom the attack was from one to five years old one might contract the disease with chances against it, and if contracted, only in a light form. If unvaccinated and you get the disease, you stand just an even chance of recovery or death.

Fever.

FEVER is a disease which affects the system generally, and is characterized by more or less excitement of the circulation, increased heat, diminished strength, and, oftentimes, unnatural thirst. The degree of excitement is measured by the state of the pulse. Of this state, there are two characteristic indications: namely, *frequency* and *hardness*. A pulse is *frequent* when its rapidity exceeds that of health; it is *hard* when its stroke resists the pressure of the finger with unusual force.

In health, the pulse of an adult beats from sixty to eighty times in a minute; that of children is more frequent. The pulsations of the heart of the unborn infant, as heard through the body of the mother, are one hundred and fifty in a minute. After birth, the pulse varies from one hundred and forty down to the standard of adult age. To appreciate *hardness* of pulse, experience is absolutely necessary.

The great activity of the circulation, in fever, is intimately connected with the heat and thirst, and tends directly to waste the energies and consume the strength of the patient. The *heat* of fever

lessens or dries up the secretions, or different fluids of the body, which, in a state of health, are separated from the blood for various purposes. This is the cause of the dry skin, scanty urine, etc.

A *crisis* of fever is that period in its *course* when unfavorable symptoms give place to those of returning health.

A *course of fever*, or in common language, a *run of fever*, is distinguished by a great variety of symptoms, which will be more particularly spoken of in the pages which follow.

Typhoid Fever.

OF the different kinds of fever, this is one of the most common and widely prevalent. The name *typhoid* is from two Greek words which mean *like typhus*, or *similar to typhus*. The word *typhus*, from a Greek word signifying *stupor*, means *stupid, dull or low*; and, when applied to a fever, implies that is *low*, or characterized by great *nervous depression*.

Typhus and typhoid fevers, if not identical, are so similar in history and treatment as to make unnecessary their consideration under separate heads. The following is one of the differences claimed to exist between the two: namely, in *typhus* fever, the belly is flat; there is no marked disease of the bowels, and generally no diarrhœa until the second or third week. In *typhoid* fever, on the contrary, some small glands, called *Peyer's glands*, situated in the lower part of the small intestines, are always inflamed, and sometimes ulcerated; and consequently, among the symptoms most frequently noticed, are diarrhœa, and drum-like swelling of the belly, called *tympanites*.

Symptoms.—The disease often has precursory symptoms. For several days before its actual beginning, the patient droops. He may attend to his various duties, but does not seem well; he is low-spirited and languid; is indisposed to any exertion of body or mind; has pains in the head, back, and extremities; loses his appetite; and, although dull and perhaps drowsy in the daytime, his sleep is interrupted and unrefreshing at night. The immediate harbinger of the fever is a *chill*, often so marked as to cause violent shivering.

The history of the first week shows increased heat of the surface; frequent pulse ranging from eighty to one hundred and twenty; furred tongue; restlessness and sleeplessness; headache and pain in the back; sometimes diarrhœa and swelling of the belly; and sometimes nausea and vomiting.

The second week is frequently distinguished by an eruption of small, rose-colored spots upon the belly, and by a crop of little watery pimples upon the neck and chest, having the appearance of minute drops of sweat standing on the skin, and hence called *sudamina*, or *sweat-drops*; the tongue is dry and black, or red and sore, the teeth are foul; there may be delirium and dullness of hearing; and the

symptoms generally are more serious than during the first week. Occasionally, at this period, the bowels are perforated or eaten through by ulceration, and the patient suddenly sinks.

If the disease proceeds unfavorably into the third week, there is low muttering and delirium; great exhaustion; sliding down of the patient towards the foot of the bed; twitching of the muscles; bleeding from the bowels; and red or purple spots upon the skin.

If, on the other hand, recovery takes place, the countenance brightens; the pulse moderates; the tongue cleans, and the discharges assume the appearance they have in health.

New Treatment of Typhoid Fever.—The systematic treatments of typhoid fever heretofore in force are apparently about to be reinforced by the administration of a vaccine in a manner similar to, though not identical with, the present treatment of diphtheria by anti-toxine. The difference in the new treatment for typhoid fever will be the cultivation of a vaccine from the disease germs in the person infected rather than from a horse that has been inoculated from blood obtained from other infected beings. This is known as "*autogenous therapy*." The results seem to be better than a vaccine made from any culture. The dosage is used according to the severity of the disease and the reaction of the patient to the injection. The preparation of this serum may be briefly described according to the manner devised by Dr. Mac Fadyen.

The cultures of the bacillus of typhoid fever are ground up in a mortar in a temperature of liquid air and then injected into a horse and the blood serum of this animal acquires an "anti-toxine power" toward the bacilli, similar to the preparation of diphtherial bacilli. Tests for the strength are made in the same manner and then the patients are injected with the vaccine. From thirty to forty million bacilli are given once or twice on successive days. Should unpleasant effects occur the interval would be lengthened or discontinued until the effects have passed off. In many cases where three series of inoculation were used, of about 90 per cent of the cases reported, it was the consensus of opinion that while no appreciable shortening of the disease below the usual three weeks occurred, the cases *seemed milder* and were decidedly benefited by the treatment, and the number of lengthy cases with complications were distinctly diminished. The vaccination of people to prevent typhoid is at present being carried out, and in some of the large hospitals nurses are not accepted who will not be inoculated to prevent their contracting the disease.

In the effort to make the army immune from typhoid fever wholesale inoculation (or vaccination) with typhoid serum is going on at Fort Banks, Boston Harbor; although it is not compulsory, the men are prompt to volunteer for the sake of the advancement of science. Officials in charge of the anti-typhoid crusade expect to render the entire army immune, that the vaccination will then be carried out in the navy and eventually among the people at large.

Four hundred and sixteen persons were inoculated in Ceylon and not one of them contracted the disease, although typhoid fever is very common in that country.

Prevention of Typhoid.

It is a duty that we owe to friends as well as ourselves to use all possible protection that the disease will not be spread, as the cause of the disease has been found in every case of death. It is necessary that we destroy all germs without the body and those possible for us within the body, which may be sources of contagion. While heat would probably be the best and easiest method used and the temperature of 160 degrees Fahrenheit, of course this method would be impractical. The discharges from the bowels are in 90 per cent. or more of the cases the danger carriers, and when the germs dry and get blown about in the air, their danger of mischief is increasing. Should discharges be allowed to contaminate drinking water the danger is almost unlimited, as in the linen of typhoid patients and the hands of those that care for them. The following illustrates the desirability of leaving nothing undone when caring for the discharges from a typhoid patient. The town of Plymouth in Pennsylvania had a population a few years ago of 80,000 people. During January and February of that year a case of typhoid ran its course and the discharges, without any attempt at disinfection, were carried out and thrown upon the snow at some distance from the house but on a slope inclining toward a mountain brook, which later became a part of the water supply of the town. After the thaw in March the brook was allowed to empty into the reservoir, and fifteen days later an epidemic of typhoid began which ended with a report of 1,200 out of the population of 80,000 becoming sick with the disease and the death of a great many of them. Water boiled and then cooled is much safer than trusting to the many patent filters on the market, and milk, if suspected, should be treated likewise, though a pure supply should be obtained.

Disinfection.—Carbolic acid after prolonged action is probably sufficient to remove the danger, but a quicker method is desirable.

Corrosive sublimate, 1 to 1,000 strength, is excellent. It attacks metal piping and therefore makes the repairs too costly.

Lime is the most efficient and being easily obtained is safe and cheap. Any solution of lime which is strong enough to be markedly alkaline can be tested by touching a small piece of litmus paper to the solution, when, if alkaline, it will turn blue. If the discharges are thoroughly stirred in a solution of about the consistency of white-wash and then turned down the closets, the danger will be reduced to the minimum, and by paying strict attention to the hands and wrists with soap and water and scrubbing brush, the danger to yourself will be prevented. The sick room should be large, airy, well ventilated and without unnecessary furniture. The bed should be where the light may come to it from the side rather than having the direct rays of light coming over the foot of the bed and shining in the patient's eyes; all unnecessary heat should be excluded, as the fever of the patient would only be increased and the temperature of the room had better be kept at 65 degrees. Open fires are greatly to be preferred for the much better ventilation afforded, with the additional advantage that they do not dry the room as rapidly as hot air furnaces.

Bilious Remittent Fever.

THERE are three principal varieties of *periodical fever*, which though varying considerably from each other in several particulars, are yet essentially, in their substance, but *one disease*. These are *Bilious Remittent Fever*, *Pernicious Intermittent* or *Congestive Fever*, and *Intermittent Fever* or *Fever and Ague*. According to the custom of most writers, I shall treat them separately, beginning with Bilious Remittent Fever.

Symptoms.—The attack is generally sudden and well marked. Some writers say it has no premonitory symptoms; others that it has. The more general understanding is, that for a day or two, or even longer, before the onset, there is a sense of languor and debility, slight headache, lack of appetite, furred tongue, bitter taste in the mouth in the morning, pains in the joints, and general uneasiness.

The formal onset is nearly always marked by a distinct chill or rigor,—sometimes slight and brief; at other times severe and prolonged. The chill may begin at the feet, or about the shoulder-blades, or in the back, and thence run like small streams of cold water poured in every direction through the whole body. There is *generally* but one well-marked chill, the returns of the paroxysms of fever being seldom, after the first, preceded by the cold stage.

At certain periods of the day there is an increased intensity in the symptoms of the disease, occasionally preceded, though generally not, by the chill. Between this period of severity in the feverish symptoms, and a similar period which follows it, there is generally a decrease in the violence of the symptoms, during which the fever moderates, but does not, as in fever and ague, entirely go off; has distinct *remissions*, but not complete *intermissions*.

During the hot stage, the pulse is up to one hundred and twenty, or one hundred and thirty. There are pains in the head, back, and limbs, of a most distressing kind.

The tongue is generally covered with a yellowish or a dirty-white fur; and in bad cases in the advanced stage is frequently parched, brown or nearly black in the centre, and red at the edges. There is no appetite for food, and generally nausea and vomiting; and usually there is pain and tenderness in the epigastrium. The bowels are at first costive, but afterwards become loose, and there are frequent evacuations of dark, offensive matter.

Causes.—This disease is produced by malarial exhalations from the decomposition of vegetable matter. It is most prevalent in hot climates, and in the summer and autumn.

Treatment.—If the fever be in the formative stage, and has not fully developed itself, give an emetic (1), (2), and follow it with a mild cathartic (7), (13).

If the disease be already developed, sponge the body all over several times a day, with cold or tepid water, according to the feelings of the patient, and give cooling drinks (132), (133), (298), (299). To moderate the fever, give three-to-ten-drop doses of tincture or fluid extract of *veratrum viride*. The compound powder of *ipecac* and opium is a valuable preparation for the same purpose. Give cold water as drink if desired by the patient, or let him eat ice.

When the headache is very severe, let poultices be applied upon the temples or behind the ears; and the same remedy to the pit of the stomach, when there is great tenderness, is often desirable; though a mustard poultice will sometimes do better.

During the remissions of the fever, quinine and other tonics are to be given, as in fever and ague. Quinine, in large doses, acts almost as a specific for these diseases.

Malaria.—(Congestive Fever.)

Fever and Ague. Intermittent Fever.

THIS is the pernicious or malignant form of *malarial* fever. It is marked, either in the earlier or later stage, by a rush of blood towards one or more organs, by which they are crowded full and *congested*,—hence its title of *congestive* fever. It may be *intermittent* or *remittent*,—more commonly, it is the former. It may assume any of the types of periodical fever, but it is most frequently quotidian or tertian.

It is a kind of fever in which there is a succession of attacks with equal *intervals* and *intermissions* that are complete but unequal, on account of the uncertain duration of each fit.

An *interval* is the period of time between the beginning of one fit and the beginning of the next.

An *intermission* is the period of time between the close of one fit, and the beginning of the next.

The different varieties of *ague* take their designation from the length of the interval in each case.

The interval of a *quotidian*, or *daily* *ague*, is twenty-four hours.

The interval of a *tertian*, or *third-day* *ague*, is forty-eight hours.

The interval of a *quartan*, or *fourth-day* *ague*, is seventy-two hours.

Laveran discovered about 1880, by persistently investigating the blood of persons suffering from malaria, a parasite in the blood. His researches were published and soon confirmed by physicians the world over, leaving no possible doubt that the only cause of malarial fever is a parasite which multiplies enormously in the blood of infected persons. But how does the parasite get into the blood?

About 1897 Professor Ross discovered that water-breeding **Mosquitoes** do not obtain these parasites from decayed vegetable or animal matter but by sucking the blood of persons already suffering from malaria. These parasites in turn multiply rapidly in the stomach of the **Mosquito** which of course is *infected*, and when the **Mosquito** bites a person—that person also becomes *infected* with malaria. Therefore malaria is not caused, as many suppose, by decayed vegetable matter and low marshy districts containing stagnant water except as these are the breeding places of the infected **Mosquito** that spreads the disease broadcast. (See articles in this book on **Flies** and **Mosquitoes**.)

Symptoms.—The disease first develops itself by an *ague-fit*. This has three stages, the cold, the hot, and the sweating. The cold stage is very marked. The patient has a sense of debility, yawns, stretches, has no appetite, and does not wish to move. The face and extremities become pale, the skin shrinks, causing universal *horripilation*, or *goose-flesh*; the patient shakes, and his teeth chatter.

After a time, these symptoms decline, and the hot stage comes on, which is characterized by high fever, with its various uncomfortable sensations.

When this fever passes off, it is followed by the *sweating stage*, during which a moisture breaks out, which increases, frequently, to a profuse sweat; the body returns to its natural temperature, the pains and aches disappear, and a feeling of health comes back.

During the cold stage, the blood is driven inward from the surface, and particularly oppresses the spleen, which, in cases of long standing, becomes swelled and permanently enlarged. This swelling may be plainly felt, and is often quite perceptible to the eye. It is called *ague-cake*.

Ague-fits begin at different hours of the day, and generally terminate in the evening.

A *quotidian* usually begins in the morning; a *tertian* at noon; and a *quartan* in the afternoon.

The cold stage is shortest in the quotidian, and longest in the quartan.

Thus the longest fit has the shortest interval, and the shortest cold stage; while the shortest fit has the longest interval, and the longest cold stage.

There are also double tertians and double quartans, wherein the fits repeat themselves,—sometimes the same day, at other times on alternate days.

To these varieties, the terms *postponing* and *anticipating* are applied, according as the intervals are growing longer or shorter. When a person is recovering from ague, the interval may gradually grow longer, the attack being *put off*, or *postponed*. But if the disease be increasing in severity, the attack may *anticipate* its usual period, making the interval shorter.

Tertians are more common than either quotidians or quartans.

Agues are more prevalent in spring and autumn. Fall agues are most severe and dangerous.

Treatment.—First clear the bowels with the fluid extract of senna or the preparation (21). Then, in the cold stage, give hot, and in some cases, stimulating drinks. Administer hot footbaths, and putting the patient in bed, apply bottles filled with hot water to the feet, sides, and back, and in every way try to excite warmth and comfort.

In the hot stage, give cooling drinks, and camphor (117), (118) in decided cases; or, what is better, quinine (67) in two teaspoonful doses every half hour, at the same time giving five-drop doses of tincture or fluid extract of *veratrum viride* every hour.

During the sweating stage, stop the *veratrum*, and rub the patient with dry towels.

In the intermission, give quinine (62), in three-grain doses once in three or four hours, and continue it, gradually decreasing the dose, a fortnight after the cessation of the attacks. The following is a good preparation: quinine, one scruple; elixir of vitriol, one dram; dissolve the quinine in the elixir, and add tincture of black cohosh, fourteen drams. Twenty drops are to be given, in a little water, once an hour.

Warburg's Tincture is a medicine which has had a very high reputation in India for administration in malarial and other diseases associated with chills and fever, and is there known as the anti-periodic tincture. It is supposed to contain in addition to 80 parts of quinine sulphate, 32 parts of rhubarb, 8 parts of camphor, 100 parts of aloes and one part opium. These are mixed with seven or eight different aromatics among which are mentioned cubeb, gentian, myrrh and elecampane. The dose is one to four teaspoonfuls taken as needed.

Quinine is the one medicine which surely relieves and cures this disease.

It is important, in fever and ague districts, to avoid the hot sun, and the damp evening and morning air.

Sleeping Sickness.

THE *parasite* which causes this disease and which was called Trypanosome was discovered in 1902.

This disease is spread by a fly called the Tsetse fly or *Glossina Palpalis*, and it is claimed that the *parasite* adheres to its mouth, so when it bites, the *parasite* is transferred to the wound.

The disease is confined principally to Africa and South America where whole native districts are said to have been depopulated.

Treatment.—Koch and Manson recommend arsenic in the form of atoxyl as very effective.

The German Commission, sent out to East Africa under Koch to investigate Sleeping Sickness, found that the action of atoxyl was the most valuable of any drug in the treatment of this disease so far. This has proved valuable in all stages and has reduced the mortality in 1633 cases to eight per cent, which is a great improvement upon anything heretofore used, as the mortality formerly was very high.

The drug is an arsenical preparation and may be given in doses of three-quarters of a grain or three grains daily. This drug is used with the best results by hypodermic injection under the skin, and larger doses must not be used, as the liability of poisoning as in arsenical preparation must be looked out for. This usually manifests itself either in the eye or by paralysis.

Rheumatism.

THIS is an inflammation of a peculiar character, being caused by acid or poisonous matter in the blood, and having for its seat the *fibrous tissue* or that thready texture which enters largely into the composition of the cords and muscles of the human body. The *synovial*, or lining membrane of joints, is also peculiarly subject to rheumatic inflammation. Hence the terms, *muscular rheumatism*, and *synovial rheumatism*. There are also acute and chronic rheumatism.

Lumbago.

Lumbago is rheumatism in the muscles of the back, aggravated perhaps by sudden cold from sitting in a draught or by wet feet or other exposure.

For external application use the following:

White Soap,	4 ounces	Oil of Rosemary,	$\frac{1}{2}$ ounce
Camphor,	2 ounces	Opium,	1 ounce
		Alcohol,	$1\frac{1}{3}$ pints

Mix and filter. Apply as a liniment. This acts like a charm on the affected parts.

For prescription and general treatment of rheumatism see pages 526 and 527.

Acute Rheumatism.

Is a very painful affection. It is most frequently brought on by exposure to wet and cold after violent and fatiguing exercise of the muscles.

Symptoms.—Its principal characteristics are: high fever, with a full, bounding pulse; furred tongue; profuse sweat, which has a sour smell, and seems to increase the weakness without relieving the pain; scanty and high-colored urine, with brick-dust settlings; and swelling of the joints, with slight redness, great tenderness, and severe pain, which is particularly agonizing when the patient attempts to move.

This affection often changes suddenly from one part of the body to another, or from one set of joints to another. This sudden shifting, termed *metastasis*, is peculiarly dangerous; for sometimes the inflammation, seeming to regard the constantly moving heart as a large central point, suddenly seizes upon its lining membrane and occasionally proves speedily fatal.

Treatment.—For articular rheumatism, some form of the salicylates must be used and continued till all pain and soreness have entirely ceased for several days. Omit all sweets, condiments, and much meat from the diet.

For relief of a pain locally in the joints a mixture of wintergreen oil, known in the drug store as gaultheria, and laudanum, two parts of the oil and one of laudanum, may be spread on ordinary cotton batting and wrapped around the joints, and a teaspoonful of this mixture which has been warmed in an iron spoon and then placed on the joints with the cotton batting will soothe the joint from two causes, the quieting effect of the opium preparation and the absorption of the wintergreen oil will produce the same effect as the salicylates which are of the same family and which it is recommended to take internally. This preparation is deadly poison and must be kept from the reach of children.

Salicylic acid and its salts, or salicin, the active principle of the willow bark, when given at the commencement of an attack, oftentimes arrests the course of the malady as effectually as quinine arrests the intermittent fever, or as opium and ipecacuanha arrest dysentery. It exerts such a beneficial influence that it is recognized by the profession as a specific. From ten to fifteen grains of salicylic acid, or the salicylate of soda should be given every two hours until relief is obtained. This usually takes place in from twelve to thirty-six hours. In most cases the fever and swelling will abate within the above time. If not entirely arrested, the disease is very much shortened.

When the specific effect is produced on the system, it causes vertigo, headache, ringing in the ears. These symptoms indicate that the medicine should be reduced in amount.

Chronic and Muscular Rheumatism.

THE chronic form of rheumatism may follow the acute as its consequence, but is more often an independent disease. It is seldom attended by fever, and in this differs from the acute rheumatism. It oftens lasts a long time, and causes much suffering.

Symptoms.—These are various, but are generally understood, even by the common people, to consist of pain, lameness, stiffness, etc., in the joints and muscles. The joints are often swollen, but not as much as in the acute disease. It is peculiar to this form of the complaint, that when the patient remains at rest for a time, he will have pain and stiffness in the affected part on beginning to move, but as he grows warm both will disappear.

Treatment.—This complaint is often palliated, and sometimes cured, by passing a current of electro-magnetism through the affected part. The diet is all-important; no sweets nor fats should be allowed, nor spices and other rich condiments are to be taken; meat is to be eaten but once a day.

The tincture or the fluid extract of black cohosh, taken in full doses, is one of the best remedies. It may be taken alone or mixed

with the tincture of poke-berries, and a tincture of prickly-ash bark, if convenient.

Opium and nitre (127) form a valuable remedy. Colchicum is much used, and has a deservedly high reputation (292), (301).

Liniments often have a good effect (190), (195), (196), (198). It is well to wear a piece of oiled silk over the affected part. It keeps up a gentle perspiration from the rheumatic surface, and materially hastens a cure. Iodide of potash in ten- to thirty-grain doses, with one-third glass of water, after food, three times daily, is an old but very efficacious remedy. The salicylates in this form are not without their special value, but are not so useful as in the acute form. The "Wonderful Wintergreen," Iodia, Tongalin, are a few of the well-known reliable preparations that may be found on the market, each of which well deserve a trial in chronic rheumatism.

To bathe the affected joint at bed-time with hot sweet oil, and then envelop it in cotton batting, to be kept on through the night, will often give much relief. Oil of cajeput relieves a large proportion of cases.

The bowels must be kept regular, and all exposure to wet feet or clothes, and to currents of cool air when sweating, must be carefully shunned.

Gout.

Gout is rheumatism's cousin; the parentage of both belong to the brotherhood of the *acids*.

A very acid state of the blood, or a state favorable to the formation of acid, is supposed to be the cause of the inflammation peculiar to both these disorders. In rheumatism, an acid which exists in sour milk, and in cider, called lactic acid, is thought to be the disturbing element. In gout, lithic or uric acid is known to be uncommonly abundant, and to form a principal ingredient of those concretions found in gouty joints and familiarly called *chalk-stones*.

The larger joints are most often affected by rheumatism; while gout prefers the smaller ones. In rheumatism, the pain is *excruciating*; in gout, it is *intolerable*. There is truth in the humorous Frenchman's description of the pains of these two complaints, which is, in substance, as follows: Place your joint in a vice; turn the screw till you can bear it no longer; that gives you an idea of rheumatism; now give the instrument one more turn, and you have gout.

Symptoms.—A fit of the gout, as it is called, generally makes its attack in the night. Its unsuspecting victim is first awakened, perhaps an hour or two after midnight, by an intensely burning, wrenching pain in the ball of the great toe, or some other small joint. This pain, with its accompanying symptoms of fever, continues with little abatement for twenty-four hours. There is then a distinct remission, when the sufferer may get some sleep. He has a similar experience

during several succeeding days and nights, when the disease, which has been growing milder, leaves him.

After a considerable interval, there is likely to be another similar visitation. The length of this interval is inversely as the number of attacks,—that is, it diminishes in length as the attacks increase in number; in yet plainer and more homely terms, the attacks come “thicker and faster”; the space between them gradually shrinking from three or four years to one or two months.

Recovery from the first attack may be complete,—the skin peeling off from the red and swollen joint, and leaving it strong and supple as ever. But, after several repetitions of the inflammation, the joint becomes stiff, its motions being obstructed by the deposit of lithic acid concretions, or chalk-stones, the limbs are sometimes actually frosted over with crystals of urate of soda (Fig. 149). This form of urate of soda crystals differs very materially from Fig. 124. When these crystals appear upon the surface, and deposits are made in the joints, uric acid is not secreted as usual by the kidneys, but accumulates in the blood.



FIG. 149.

But gout is a disease by no means entirely local in its character. It vitiates the blood, affects the system generally, and is often betrayed by general symptoms long before the local mischief is indicated by one of the attacks. Irritability of temper, unpleasant sensations in the stomach and head, and various uncomfortable feelings of body and mind, have been considered as premonitory of this disorder. Many other organs also, besides joints, are subject to the gouty inflammation. The stomach, heart, lungs, head, and even the eyes, are known to have been thus affected.

Causes.—Luxury and indolence—particularly the former—are regarded as the principal causes of gout. But poverty and activity will not always keep the disease away. Probably an improper diet has more to do with the creation of gout than all else. Starchy food, sweets, etc., which cause an acid fermentation, are most likely to set up the trouble.

Treatment.—Colchicum is the remedy for gout. It removes the disease by exciting the kidneys to action, so that the poison is conveyed away in the urine. Perhaps it acts in some other unexplained way as an antidote to the disease. One teaspoonful of the wine of colchicum may be taken two or three times a day, until relief is experienced. It should then be continued, in ten-drop doses, for a few days longer, to prevent a relapse. The colchicum may be taken in the form of prescription (301).

Coffee, drunk freely every day, is said to be a sovereign remedy for gout.

The bowels must be kept in order, but not actually purged (34), (40). The diet must be simple and unstimulating.

Let the inflamed joint be bathed often in a saturated solution of bicarbonate of soda in soft, warm water. Cold applications should not be made, as there is danger of provoking a sudden change of the inflammation to some internal organ.

A regulation of the diet and open air exercise are the best methods of fighting the disease.

Scrofula, or King's Evil.

THE word *scrofula* is derived from the word *scrofa*, meaning swine, and was used in this connection by early students of medicine because people affected with this trouble resembled hogs. The swelling is due to a greater or less enlargement of the glands in that region which are very numerous. It has been said to be caused by many diseases, but since the discovery of Professor Koch it is well known that the disease is identical with tuberculosis, or consumption, but in this trouble the disease is in a very mild form and if the germ does not break into the air passages and infect the lungs or throat and other parts of the body, the danger is very small. The action of the glands in the throat and throughout the body is probably to take from the circulation all poisons that it is possible to remove. This action is similar to the action of the kidneys which remove the poisons from the blood and glands in the intestines which remove the valuable elements from the food which has been taken into the body. Other glands beside these, which are known as cervical glands, are the glands in the region between the heart and lung, known as the mediastinal, those of the mesentery or fatapron which are in the abdomen to protect the bowels, and those back of the lining of the bowels known as the retroperitoneal. These glands can be affected through the tonsils, as in sore throat, bad teeth or ulcerated gums or other infections, by the lung in consumption, of the pleura of the heart and even through the bowels.

Symptoms.—Their presence can be known by the presence of kernels just beneath the skin at the angle of the jaw and in the region of the windpipe and in the other regions that could only be suspected or found after careful examination. The patients are usually thin, pale, with prominent veins, small bones, large and staring eyes and hectic flush on the cheeks. They are especially liable to be feverish at night. Their circulation is poor, as shown by cold feet and hands, and very likely have some skin trouble almost all of the time, such as a rash or many pimples about the scalp, face and ears. The eyes may become affected, the hairs of the lash drop out and discharge be present.

Treatment.—The treatment of the gland itself should be surgical if the presence of pus is shown by sudden tenderness appearing over it. Under perfect aseptic conditions, which is described under surgery, the gland should be opened, the pus allowed to drain out, the

inside scraped and an antiseptic dressing continually kept on until the matter has all drained away.

The constitutional treatment is of great importance, as in many cases the glands can be prevented from breaking down and in others can be made smaller. Iodine in the form of the tincture may be painted on with a camel's hair brush, or better still, in the form of iodine vasogen, which is a preparation of iodine and an easily absorbed ointment, or petrogen, very similar to the latter may be rubbed into the glands in small amounts twice a day. Some preparation of iodine internally is also indicated. Iodide of potash in 5-grain doses well diluted three times a day, or a preparation called soluble iodine in 2 to 5-drop doses three times a day, or the syrup of iodide of iron in 5-drop doses given in milk. Great attention should be paid to the improvement of the general health. The diet must be nourishing, large in amount, and forced on the patient. There cannot be too much milk, cream, eggs, meats, potatoes and easily digested vegetables given; hygienic precaution must be taken, baths, exercise, sleep, place of rest, good sanitation and pure air must all be taken into account. Cod liver oil, either as the pure oil or as some of the various emulsions, tasteless, if the stomach repels, or the stronger preparation may be given.

Scurvy.—*Scorbutus*.

OWING to a better knowledge of this disease, and of its proper treatment, it is much less common than in former years. It chiefly affects seamen who make long voyages; but is not entirely unknown on land.

Symptoms.—Languor, loss of strength, and great depression of mind, are among the first signs of scurvy. To one about being attacked, work and play are alike burdensome. There is no heart even to move. The face and the whole skin look pale and bloated, and the breath has a fetid smell. The gums are swelled, soft, red, and spongy; and they bleed upon the slightest touch,—sometimes the blood oozes from them spontaneously. The teeth get loose, and often fall out. The skin becomes covered with bluish or purple spots,—looking precisely like bruises. These spread and run into each other, forming large patches of discoloration.

These spots appear to be formed by the bursting of the small capillaries of the veins and arteries, which have grown too weak and rotten to hold their contents, and the infiltration of dissolved blood into the cellular substance under the skin.

Ulcerous sores break out in various parts of the body, which smell badly, and discharge a thin matter. These ulcers are covered with a crust. Various parts of the body, the bones included, are twinged with pains. The pulse is weak and soft. All the secretions, including the urine, have an offensive smell,—as though the whole body were approaching putridity. In truth the whole man seems to be

disintegrating, decaying; the flesh becomes soft, and dwindles; and the bones break easily,—being afflicted with a decay approaching to rottenness.

In bad cases, blood is discharged from the bladder, bowels, womb, nose, and mouth; and the smallest exertion is followed by fainting, and in many cases, by sudden death.

Causes.—The disease is owing to the use of food and drink beginning to be decomposed, and to living long at sea without vegetables containing certain acids. Its attacks are likewise encouraged by whatever weakens and depresses the nervous system, as long exposure to a moist, damp air, particularly when this is connected with confinement on board a ship, unclean linens, occasional loss of the usual rest, and great fatigue, as in storms. The force of these causes is increased by the loneliness, the sadness, and the despondency of the sailor's life.

Treatment.—Sailors are very much protected from the disease now, by frequent returns to land, during long voyages, to procure fresh means, vegetables, and water. This practice is very generally adopted, particularly by whale-ships, which make long voyages; and the result is, very little scurvy, and general health among the men.

One of the best medicines for the disease is quinine; it may be given in from one to two-grain doses twice or three times a day. Gentian and quassia are also suitable remedies; so is the muriatic citrate of iron (73).

But the best of all remedies are fresh and succulent vegetables, and also fruits. Spinach, lettuce, dandelion, sorrel, cresses, and the like, are among the very best things when they can be had. Lemon or lime-juice produces the happiest effects. Potatoes are among the very best remedies,—particularly if scraped and eaten raw. They are also valuable when cooked. Spruce beer is a good antidote; and may be made at sea from the essence. Many kinds of beer may be brewed at sea, which are valuable.

When the bowels are costive, cream of tartar, dissolved in water, and drunk freely, will be found the best remedy. If there be looseness of the bowels, morphine, laudanum, a tea made of logwood, or geranium, or the tincture of catechu, will be suitable.

For the spongy gums, a solution of alum applied to them will be proper, or a mixture of equal parts of tincture of myrrh, catechu, and Peruvian bark; and ulcers may be washed with the same.

Vinegar, which is an excellent preventive in this disease, may be made at sea from molasses and water exposed to the sun. Two ounces of nitre dissolved in a quart of vinegar, and given in tablespoonful doses, three times a day, is said to be an excellent remedy.

Every ship, on going to sea, should be supplied with dried fruit, as raisins, currants, whortleberries, prunes, etc.; and should have peas,

beans, rice, flour, sugar and molasses. Beside these, ships should have essence of spruce and lemon, and dried balm, sage, pennyroyal, and other herbs.

Seamen, when down with this disease, should be moved with care, as the spark of life may be easily extinguished.

Purple Disease.—*Purpura Hemorrhagica.*

THIS has been sometimes ranked as an affection of the skin; but it is not such; it is rather a disease of the general system.

Symptoms.—The complaint is known by the appearance upon the skin of two kinds of spots; the one kind are small, round, bright-red points even with the surface, and changing in a day or two to a purple or livid color, which are yellowish brown when about to disappear. This variety of the purples is quite simple, attacking, generally, young persons, and in warm weather. It is sometimes tedious in its course, but never dangerous. It requires little treatment—pure air, wholesome diet, with quinia and the mineral acids, make up the chief part of it. It may be known by the spots not disappearing when pressed upon by the finger.

The other and more dangerous variety of the disease is attended, generally, by faintness, wandering pains, great debility, and the appearance upon the legs, arms, and body, of dark-red spots, and irregular, livid patches, looking just like the marks of recent bruises. These marks are caused by the effusion of blood in patches under the skin; and in this respect they are just like bruises, only they are produced by different causes.

In the rapid progress of the disease, dark venous blood frequently oozes from the tongue, mucuous membrane of the mouth, nose, breathing tubes, ears, vagina, womb, stomach, etc. The other symptoms vary in different cases very much, but generally indicate great disturbance of the system.

It often runs a very rapid course, but sometimes remains for months. The disease, as seen in the country, is oftentimes associated with rheumatism, it not infrequently being the forerunner of a long and tedious rheumatic outbreak.

Treatment.—The bowels are to be kept regular by gentle physic (26), (21), (12), (15).

Iron is a valuable remedy (73).

Astringents generally have a good effect (156), (159), (279), (305). The best astringent in this complaint is gallic acid, taken in five-grain doses every three or four hours.

The sponge bath, twice a day, with tepid or cool water, and followed with gentle rubbing with a coarse towel, will do much to restore and equalize the circulation in the skin.

During the active stage of the disease, the diet should be very

light,—simple toast-water, rice and arrow-root gruel, and either alum or wine whey.

While getting well, the patient may have a more nourishing diet, consisting of tender fresh meat, broths, etc.; and must take gentle exercise in the open air.

When associated with rheumatism, the latter disease should be treated on the same lines laid down elsewhere for rheumatism.

Iron usually is the mainstay for building up the blood, and should be given in some mild, unstimulating form, such as Bland's pills or peto-mangan, petonate or albuminate of iron, etc.

Diphtheria.

DIPHTHERIA is an acute, contagious and infectious disease, whose characteristic feature is the formation of a pseudo-membrane upon a mucous surface. It is a comparatively recent disease in this country, and only lately well understood as to its origin and pathology. The excessive mortality of this disease within the last fifty years has been so great as to justly frighten all parents at its approach, and lead them to regard it as the most terrible of all modern scourges. In New York City alone, over fifty thousand deaths have occurred in twenty-five years. It is one of the most fatal, as well as one of the commonest of children's diseases. It is impossible to say at the outset whether the type will prove to be a mild or severe one. A case commencing with sudden, severe constitutional symptoms and high fever may go on to recovery; while one with slow, gradual development, and little systemic disturbance, may progress gradually and end in death. Nor is the amount of membrane present in any case a guide as to the final outcome of the case. Many very mild cases may not at first be recognized as diphtheria until later, when some post-diphtheritic paralysis or other complication ensues. These mild cases are equally contagious, and often the origin of a severe and most malignant epidemic.

Cause.—True diphtheria is caused by a germ known as the Klebs-Löffler bacillus, either alone or in company with other germs; it is originally a local disease, becoming general as the poisons emanating from these germs are absorbed into the system.

This bacillus is always present in diphtheria, and found only at the site of the local infection, and when injected into animals produces all the characteristic symptoms of the disease.

In doubtful cases, recourse is now had to the finding of these germs by cultures made from little particles taken from the suspected membrane.

There is, besides the true diphtheria, a pseudo-membranous inflammation which runs a mild course, but which cannot be distinguished clinically from the real disease, except by making these cultures in the laboratory; in the latter disease, the Klebs-Löffler bacillus is

always absent. On the other hand, there are often seen cases of true diphtheria so mild in character, and showing so little membrane, as to pass unnoticed, but which on bacteriological examination prove to be the dreaded disease; hence in all doubtful cases arises the necessity, in these modern times of refinement in diagnosis and treatment of disease, of having an examination made that the exact disease may be properly diagnosed, and the appropriate treatment be speedily instituted. The development of bacteriological science within the last few years renders this a very practical and sure test of the presence of the disease. Accepting the proven origin of the disease to be microbic, still there are many circumstances influencing the development or arrest of the germs when once introduced into the throat, since it is one of the most variable and uncertain of the contagious diseases. It is said that a normal throat will not be attacked by the bacillus, while one with some slight abrasion, inflammation, or other lesion, certainly offers a fertile field for its development. It is essentially a disease of childhood, although it occurs at all ages. Cold and dampness, and all unsanitary conditions are known to favor the germ development.

It occurs mostly in cold weather, as at this time catarrhal conditions are present, favoring the rooting of the germ.

Propagation.—The germs are introduced for the most part by the air, although food may contain these bacilli. Domestic animals have been known to frequently convey the poison. All articles of furniture, clothing, the hands of attendants, etc., are common carriers of the diphtheritic germ, which is very tenacious of life, unless previously disinfected, hence the absolute necessity of the greatest care in thoroughly cleansing everything which has come in contact with a diphtheritic patient. The writer once had the disease. The mattress on which he slept was put away, after a simple cleaning, in the attic for two years, and when later on it was brought down to accommodate his two little brothers on one occasion, the disease was communicated to them and they both died.

Incubation Period.—This is quite uncertain in the ordinary case of air inoculation, depending on the condition of the throat, but probably it varies from one to twenty days. In the case of inoculation of the bacillus into the tissues of animals the period is only from one to three days.

Location of Disease.—The tonsils, uvula, pharynx, nasal passages and the larynx are the ordinary locations where the membrane is formed, but it may be found less commonly on the conjunctivae, border of the anus, vagina, and respiratory tract.

All the internal organs may eventually become involved through the absorption of the germ poisons, and at the autopsy show marked hemorrhages, inflammations, congestions or fatty degeneration of their tissues.

Symptoms and Diagnosis.—The characteristic feature is the membrane, which is apt to be of a dull gray color, firmly adherent to the tonsil or throat, spreading gradually and becoming thicker. To distinguish it from simpler follicular tonsilitis, which is so common, is often difficult and frequently impossible without a bacteriological examination. The membrane of simple tonsilitis is white, beginning as little white specks like the curd of milk, and is usually easily removed without bleeding. The membrane of diphtheria spreads and attacks the uvula and back of the throat, the adjacent tissues become swollen, the neck increases in size, breathing becomes more difficult, the pulse more rapid and smaller, and prostration with drowsiness, as a rule, more and more marked.

In simple cases, there is usually not much fever, but in severe cases the temperature may run high, with great prostration and languor; delirium and restlessness accompany the severe cases of great absorption of poison. The heart usually is rapid, with feeble pulse, but many severe cases have a very slow pulse, which ordinarily is a bad symptom. The heart in diphtheria is always the uncertain element, many cases dying suddenly and unexpectedly from heart paralysis. Albumen often appears in the urine, and is usually an evidence of the involvement of the kidneys; this nephritis may become chronic and persist long after the convalescence from the original disease, and may even prove fatal. When the membrane is desposited in the nares, the breathing is more labored, and bloody mucus may be seen in the nostrils, which hardens, forming crusts, or may run down on to the lip and cause sore places. As the tonsils grow larger and the nose becomes plugged, sleep is more and more disturbed by snoring and inability to properly inspire the air, so that the child tosses from one side of the bed to the other every few minutes. Add to this an encroachment by the membrane on the vocal chords or the larynx, and one sees a truly terrible malady, distressing in the extreme. The encroachment into the larynx is suspected when the voice becomes husky and hoarse; it finally may be reduced to a whisper. The membrane may be limited to the larynx alone, as in the so-called *membranous croup*, which is no more or less than diphtheria of this region. The symptoms of this affection are at first local, and as the disease progresses, become more and more marked and distressing till death ensues from suffocation. The face becomes blue, the chest heaves with the deep, labored respirations, the nostrils dilate, and the little spaces below the collar-bones more and more depressed and drawn in.

The severity of the case depends much on the amount of absorption from the throat, nose, or pharynx, of the toxins produced by the growth of the germs on the one hand, and the ability of nature on the other hand to resist the invasion.

The odor of the breath in diphtheria is characteristic, and when once experienced is never forgotten.

Sequelae.—Besides the chronic catarrh which is left at the original site of the membrane, and the anæmia (or paleness consequent on the impoverished blood), the most frequent, and the most characteristic sequel of diphtheria is paralysis, which comes on in from one to five weeks after convalescence. This paralysis lasts from two to six weeks, though it may last for months, and even for a lifetime. It is in no wise, apparently, proportionate to the severity of the disease. It is seen in all parts of the body, particularly the throat and nose, causing a nasal twang to the voice, and the regurgitation of food through the nose. It may affect the muscles of deglutition and speech, may attack the legs, arms, diaphragm, and the sphincter muscles of the bladder and rectum.

Prognosis.—The prognosis varies according to the age and health of the patient, the severity of the symptoms, place of attack, and the character of the epidemic prevailing; nasal and laryngeal complications, as well as the large area of mucous membrane involved, increase the risks of the patient. The mildest cases may terminate fatally from relapse. The heart may give out at any time, and death may be close at hand when apparently all is going well. Unfavorable symptoms are pallor, prostration, vomiting, and inability to take much nourishment, weakness of pulse with great rapidity or slowness, hemorrhages into the skin, restlessness and delirium.

Prophylaxis.—The complete isolation of the patient in a room of the top story, supplied with as little furniture as possible, is requisite. All utensils and dishes should be thoroughly disinfected before taken out of the room. All discharges received into a vessel containing corrosive sublimate. All clothing should be boiled when possible.

During the disease, some volatile oil, like eucalyptus, turpentine, carbolic acid, etc., should be vaporized through the room. The nurse in charge should not be in communication with other members of the household, nor children of the family allowed to play with others in the neighborhood, although they should be kept out of doors liberally, but carefully fed and in every way protected from catarrhal disorders. The patient after convalescence should be thoroughly bathed with soap and water, and finally with corrosive sublimate solution, including the hair. As much as possible of the furniture and other equipments that cannot be thoroughly cleansed by boiling water, steam or corrosive sublimate, should be destroyed; finally the room and its contents should be fumigated with sulphur fumes by burning three pounds of sulphur to every thousand cubic feet of air space.

Members of the family should be kept from school and church and other public places, and their mouths and nostrils daily washed with some disinfectant like carbolic-acid gargle. Only thin, washable clothing should be worn in the sick room.

Treatment.—From the first the treatment should be supportive, tonic, and stimulating. The temperature of the room should be kept at about seventy degrees, and plenty of fresh air and sunlight admitted. The clothing and bedding should be changed frequently, and the recumbent position without exertion be insisted on. The diet should be liquid, and given every two to four hours, in definite quantity, not exceeding what the child can easily digest. Beef-tea, milk and lime-water, egg and milk, Bovox or Bovinine in milk or water, are samples of the class of foods to be administered. Alcohol in the form of brandy, whiskey, champagne, etc., should be given freely; there is more danger of giving too little than too much. The more septic or poisoned the patient, the more the alcohol will be tolerated and required. Very large amounts are taken in this disease, as well as in all severely septic diseases. A five-year-old child will easily take from two to fifteen ounces of whiskey a day. Other valuable stimulants are strychnine, digitalis, ammonia, camphor, etc.

Fever when high should be allayed by cold sponging or the cool bath. All hemorrhages, diarrhœa, or other exhausting complications must be stopped. Of internal treatment, perhaps none has stood the test of time better than that recommended years ago by Dr. Jacobi of New York, of which the following is an illustration:—

Corrosive sublimate, one-half grain; wine of pepsin, four ounces. Teaspoonful every two hours, for a child five years old. This is an antiseptic to the intestinal tract, and helps disinfect the system. *Locally*, the throat is to be sprayed with a solution of peroxide of hydrogen. If this smarts or excoriates the mouth, it may be diluted even to equal parts with lime water. This solution may be injected through the nose. It must be used freely and often.

To destroy the bacilli, a one part to one thousand solution of corrosive sublimate in the form of spray may be used after the cleansing with the peroxide of oxygen solution, or what has recently been introduced as the Lœffler diphtheria spray, which consists of several antiseptics.

The use of papoid, papayotin and other solvents of membranes, is frequently very beneficial: they may be sprayed or swabbed on to the throat. The sequelæ are to be treated on general tonic principles; the catarrh is to be treated by the application of mild nitrate of silver solutions, and the paralysis by strychnia, massage, electricity, and general tonics.

These measures constitute the main essential points in treatment in those cases which for any reason do not receive the modern *anti-toxin* treatment.

Since the better understanding of the Klebs-Lœffler bacillus, attempts have constantly been made to produce an antidote to the diphtheria poison, and it would now seem as if bacteriology had at last revolutionized the entire treatment of diphtheria, for of late a remedy called antitoxin has been found and successfully tested. The

death-rate of diphtheria has been reduced nearly one half; apparently, one of the greatest boons ever sent to humanity has been realized in antitoxin.

For some time it has been known that the serum of animals immune from diphtheria, when injected into susceptible animals, would prevent the infection of cultures made from the Klebs-Löffler bacillus; and at last the essential elements, or the antitoxin, has been isolated.

Not only has it been found that the injection of a given amount of antitoxin into the human subject would kill out the diphtheria, but also that, when injected into children not yet taken down with the disease, but who have been subjected to it, this antitoxin would actually prevent the occurrence of the disease in them, or, technically speaking, render them immune.

For a long time now this modern blessing has been enjoyed by thousands of people all over the world. Reports are everywhere published by public institutions and private practitioners, speaking in figures more convincing than any statement could be, of the greatest advance in medicine that the last half century has witnessed. It is to diphtheria what Listerism was to surgery.

The essential features of this treatment consist in the injection into some convenient part of the body, like the back, loins, or thigh, of a certain amount of this liquid proportionate to the age of the patient, the severity of the disease, and the time elapsed since the outset of the symptoms.

The dosage varies with all these conditions, and the particular variety of antitoxin employed. The repetition of the dose depends on the amount of improvement in the membrane. At first a reddening about the diphtheritic patch is seen, then a thinning out of the membrane and a general amelioration of the symptoms. To prevent the occurrence of the disease, only quite a small amount is required, and it needs to be injected but once. The great advantage of this treatment, outside of its favorable statistics, is the comfort derived by the patient in not being so frequently disturbed by other auxiliary treatment, as nothing else is required to be done when the case is seen early. As a matter of fact, cases are often seen so late, and the poison has so successfully invaded the system as to render the antitoxin treatment less potent, that medical men employ local measures to help out the antitoxin. The earlier the treatment is begun, the less antitoxin will be required, and the surer the successful issue.

Like all great advances in medicine and surgery, this method is not without its enemies, who will tell of the ill effects to the blood experienced later in life. The only ill effects are certain rashes resembling hives, or urticaria, situated generally near the site of the punctures and due to local irritation. These all pass off in a few days, and are only annoying at the very worst. Should abscesses occur they may be put down as the result of an unclean syringe, or ascribed to the neglect of proper aseptic precautions on the part of the physician.

This antitoxin serum, taken from horses after repeated inoculation, may now be obtained from local boards of health, and other similar authorities, thus enabling the poor to be able to procure free of cost this antidote against the most ravenous of diseases.

Canker.—*Aptha Communis.*

VERY few, if any, standard medical writers have treated of canker. In truth, it is only a symptom of various complaints, and not itself a disease. It has accordingly been shut out from medical books. It afflicts—yes, *sorely afflicts*, numerous persons, who, though doubtless affected by some constitutional disturbance as its cause, are not conscious of any complaint except this single manifestation—canker. You find not only the disease, therefore, but complaints respecting it, in almost everybody's mouth: "What shall I do for the canker?" meets us at almost every turn. "I am sorely afflicted with the canker," says one. "I am literally sick with the canker," says another. And a third says, "I can neither eat, nor converse, nor take rest, I am in such pain from canker in my mouth." And these complaints are not unnatural, for the sufferings occasioned by this affection are indeed terrible.

Canker begins in the form of small blisters, generally upon the tongue, or inside of the cheeks or lips, or stomach, which, after a time, break and form little ulcers, which are oftentimes very sore and painful. These ulcers will, at times, not only multiply, but spread themselves to large dimensions, going deep into the flesh, and becoming painful almost beyond endurance. In many cases, the parts swell, and become so sensitive and tender that it is almost impossible to swallow the blandest food. The mouth will frequently become filled with saliva, which runs involuntarily out, to the great annoyance of the patient.

Treatment.—Canker is frequently dependent on a deranged state of the stomach and bowels. When this is the case the treatment may begin with a dose of gentle physic (12), (15), (19), (26). If the stomach be quite permanently deranged, let this be followed with a somewhat prolonged use of prescription (28) or (37), or of the neutralizing cordial. If the mouth be very sore, use a tea of slippery elm bark, or flax-seed, or a solution of gum-arabic; and as the inflammation subsides, touch the ulcerated patches with the stick nitrate of silver (lunar caustic); or use gargle (201), (202), (203), (205), (208), (209), (232), (243), (244), or sulphate of copper, eight grains dissolved in two ounces of water. A tea made of raspberry leaves, or blackberry roots, may be freely used as a drink.

One of the best remedies is hamamelis. Of this a dessert-spoonful may be held for a few moments in the mouth and then spit out. A teaspoonful may be taken internally, once an hour until relieved. Recipe 205 is not only useful as a gargle, but may be reduced by

adding one pint of water, and may then be swallowed four or five times a day, in doses of two tablespoonfuls at a time.

The diet should always be carefully regulated, and only the more simple food taken, and at regular meals.

To rapidly heal a canker spot, touch it with a wooden tooth-pick which has been dipped in a strong solution of carbolic acid. The ulcer turns white, and in a few days is completely healed.

Sexual Impotence.

As the sexual functions form the most powerful factor in our lives, both as an influence upon the home and as a great incentive to weighing our energies for all fields of social and business life, it stands to reason that their proper performance may well be considered as a fit subject in a work of this kind.

As no man that is impotent, and meaning that in a literal sense, can become the father of children, so the lack of procreative power produces a great diminution in the virility of the person.

A man prematurely impotent has his misfortune continually in his mind, and is to be sincerely pitied for in this condition he lacks energy and all power to do proper labor in his calling in life.

His friends are unaware of the condition which is producing his lack of enthusiasm in everything that goes to make life worth living, that the sexual organs are so intimately associated with the other parts of the body, that their loss of strength is quickly communicated to the brain, nervous system, and particularly the general well-being.

Then should the married state be associated with impotency no matter which sex is affected all the desired great love and even respect that one may have for the other is unsatisfied if the happiness is mitigated by this condition. Impotency in its broad meaning is a pathological condition of the sexual apparatus, which prevents the successful carrying out of intercourse.

Sexual excitement associated with the ability to perform the function is only necessary to cause the successful completion of the act—but should instinct be absent or erection impossible then impotency is present.

While some make a practice of very frequent intercourse over a long number of years, others find that its performance once or twice a month is as much as their physical being can stand.

Continual excess in venery will bring its evils surely, just as a continual excessive use of any organ of the body will result in its impairment.

The treatment of impotency should be in the building up of the body by tonics and stimulants. Strychnine, arsenic and iron will prove the most valuable. No direct drug for the excitation of the sexual forces should be used, as the exertion that follows their use will

defeat the purpose desired and the patient will be worse for having used them.

Limitation of intercourse is advised.

The following prescription is good:

R

Ferri Arsenati,	gr. ii	Arsenate of Iron,	2 grains
Ext. Nucus Vomicae,	gr. xv	Extract of Nux Vomica,	15 grains
Ergotini Bonjean,	gr. xxx	Bonjean's Ergotine,	30 grains
Zinci Phosphide,	gr. ii	Phosphide of Zinc,	2 grains
Misce et dividi in pilulæ No. xxx.		Make into 30 pills.	

Sig. One pill after meals.

Yellow Fever.

Yellow Fever (known as **Yellow Jack**, **Bronze John**).—A highly infectious but not contagious disease occurring in the warm climates and always characterized by high fever, jaundiced skin, black vomit in some cases, and usually appearing with sudden onset. In the seventeenth century this disease was noted in Southern climates. Since then all warmer portions of North and South America have contributed to its death rate. The white race seems to be far often greater affected than the colored, though the black race is more or less susceptible. People who have lived in the warmer climates do not catch the disease as quickly neither are they as sick as newcomers to the country. Elderly persons and children ordinarily are safer from attack than the middle aged, but like similar fever diseases one severe attack, should the patient survive, will be a guarantee against the disease in the future. Havana, which is the hotbed of yellow fever, has been long recognized as the point from which it spread, and until the Spanish War, when the United States was compelled for the safety of the soldiers as well as to prevent extermination of the Northern visitors, to take hold of the question, and began the precautionary measures for the wiping out of this disease, the death rate was something frightful.

Causes.—It has been now so conclusively proved that the mosquito is the carrier of the infection and the cause of the disease that all history previous to the Spanish War may well be omitted. At that time a commission was appointed by the United States to investigate the disease and was given unlimited powers in the warfare. The conclusions of this commission carry the whole story so thoroughly that they may be well quoted at this point. The **Mosquito** serves as the carrier of the parasite of yellow fever and yellow fever is carried to an individual not immune to the disease by means of the bite of a **Mosquito** that has previously fed on the blood of one who was sick of the disease. An interval of about twelve days appears to be necessary before the disease can be carried from a person lately affected to one

who is well. The bite of the **Mosquito** less than twelve days after contamination does not appear to protect the patient against any further attack. Yellow fever may be also produced by direct attack of the blood of a patient with a person who is well. But an attack of yellow fever even produced by the bite of a **Mosquito** secured immunity against further attack by experiment. Disinfection of clothing, bedding or merchandise even if it has been in contact with those sick with the disease is unnecessary, it being pre-supposed that **Mosquitoes** will not have access to such articles, and the spread of yellow fever may be completely controlled if the **Mosquitoes** are destroyed and the sick are protected against the bite of these insects. Although it is known at this time how yellow fever can be contracted as well as prevented, yet the direct cause of the disease has not yet been discovered. The extermination of the disease has now resolved itself as will be seen by the above paragraph to the destruction of the **Mosquito** and the protection of houses by suitable screens from the inroads of all **Mosquitoes** as, of course, one is unable to learn which insect has had access to a patient sick with the disease, and further the treatment by covering the surfaces of all breeding places for **Mosquitoes** with petroleum, such as marshes, old wells and stagnant water, has been found efficient in destroying the eggs before they have launched into live insects.

Symptoms.—In addition to the rapidity with which the disease manifests itself by the striking chill and high fever with an almost paradoxical pulse, many times a patient with a temperature of one hundred and three to one hundred and five having practically a normal pulse which would be unusual in any other disease, and the headache, possible sore throat, great weakness and vomiting with beginning jaundice around the eyes and upper part of the body is an expression described by Guiteras as characteristic. He describes the eyes as staring, moist and generally contracted. The cheeks and conjunctiva are congested and there is a general anxious expression. The tongue appears to be swollen and the gums are engorged. After two or three days, all of the above symptoms appear to subside and the pulse may be lowered to one-half its former rate, in which case should the disease have been a light attack, or the patient especially resistant to its poison, recovery may occur without any more serious results than slight involvement of the kidneys and a more or less irregular fever lasting for some weeks. This secondary fever in the severe cases lasts from two to three days, and by the third day has markedly abated. It is at this period when the jaundice becomes most marked and the patient is then a true example of yellow fever. Should the disease be of the severe type or the former serious symptoms occur again in a much intensified form, the yellowness increases deeply, hemorrhages of the skin occur about the body, hiccough, great weakness and exhaustion together with increased complications of the kidneys, causing intense anxiety as to the outcome. Although recovery may occur with this recurrence of severe

symptoms, the chances are poor and death is usually common at this period. One remarkable feature in the diagnosis of the disease that appeals to physicians is that the relative loss of red blood corpuscles is not as great as would be expected in a disease accompanied by the hemorrhages that occur in yellow fever.

This is probably more apparent than real for the actual loss of red cells must be in direct ratio to the amount of blood that is lost. Two or three diseases have similar symptoms to yellow fever in the early stages. One known as *dengue* or *breakbone* fever might be mistaken at first, but practically no one dies from uncomplicated dengue. The joint symptoms, while common to most diseases at first, are most pronounced of all in dengue, and the notable difference between the pulse and temperature as in yellow fever is absent in breakbone fever. In the severe types of malaria, especially the irregular and mixed forms of this disease, yellow fever may easily be suspected but all of the symptoms that are noticed at the onset of yellow fever occur, if at all, late in the progress of malaria and in a much less severe form. The mortality of yellow fever varies at different times, seasons and epidemics between twelve per cent and seventy-five per cent. Its greater ratio noted in hospital practice is probably accounted for by the severe cases being sent to the hospitals as well as during severe epidemics, when field hospitals are usually established. The average mortality, as stated by one observer, is about thirty-five per cent.

Treatment.—The treatment of this disease, as in most of the other ones, which as yet we have no specific for, is largely one of stimulating the patient and prohibiting any exhausting causes which might turn the scale. Systematic treatment for the hiccough, such as carbonated waters, very hot water, brandy and ice or a mild solution of cocaine, are usually necessary from the first, and tincture of digitalis in doses of five drops, strychnine in doses of one-fortieth of a grain are the most important to keep the heart at work and counteract any tendency to collapse on the part of the patient. Of course, in the more serious types of the disease, very strong heart remedies such as hypodermic injections of the medicines above mentioned together with ether and alcoholic stimulation may be necessary to overcome momentary collapse. The kidneys are affected to a greater or less extent and diuretics and cathartics to remove the poison from the body are in almost constant demand. Nothing is better than the citrate or acetate of potassium in twenty-grain doses three or four times a day to keep the kidneys at work, and last, but by no means least important, and probably of more importance than any medicine is the care taken in the nourishing of the patient; for at least the time when the fever is at its height nothing but liquid foods in concentrated type such as rich chicken and beef broth with milk and eggs should be taken. The patient should remain in bed long after the fever has subsided and until every possibility has passed that the heart or kidneys would be weakened by exercise.

Bubonic Plague.

Plague (Bubonic Plague).—Also known as plague death, pest and malignant adenitis, the characteristic of the disease being a general constitutional swelling of the glands throughout the body.

History.—The disease has been known since time immemorial, but it is only lately that efficient measures for its prevention and a possibility of cure have been undertaken. It was known throughout Europe and Great Britain during the sixth century, it being estimated that in one century alone 161,000 people died in London. At a later epidemic, out of a population of 500,000, 68,000 deaths occurred from this disease. It is more prevalent in China, India and in the Philippines than in any other localities. Since 1894 it has been getting a strong foothold throughout China and the Eastern countries so that as late as 1903, 2,000,000 persons have perished in one province during an outbreak. At different times it has attained a temporary lodging place in Spain, Portugal and Scotland. In some of the Eastern countries it has also made its appearance and within ten years it got a foothold in San Francisco.

Causes.—The disease is an epidemic infection caused by a bacillus known as bacillus pestus and its main characteristics are high fever, great prostration, tendency to bleeding from all parts of the body and the swellings throughout the body above spoken of. The disease is one of those which is markedly infectious but not contagious. By this we mean, the mere presence of a person in the room with one affected will not cause the disease to be contracted, but contact with that person, either through the discharges or more especially by insect bites, causes a large mortality. The disease is greatly favored by filth, in fact it is really a filth disease as the germs develop with great rapidity in dirt, poor food, overcrowding and similar media. It also increases rapidly in bad soils, may be conveyed in discharges and by about all vegetables, butter, milk and cheese. It is now known that many of the domestic animals, especially dogs and cats and rats, serve as the vehicles of contagion while the germ itself is carried to other animals and human beings through the mediumship of fleas, **Flies, Mosquitoes** and even lice. An interesting experiment which proves the method of conveyance, was used in Cairo in 1835 at which time two criminals were inoculated by plague blood and while both developed the disease, both recovered. Many physicians have contracted the disease through dissection wounds and surgical operations. The direct conveyance of the disease from man to man is possible though extremely rare compared with the many cases that occur through the bites of insects.

Prevention.—When a case of the disease appears in any locality its extension takes place very slowly. If not completely eradicated at once, later on a few isolated cases will be discovered, and after a period

of one or more years the disease then spreads with alarming rapidity, usually among the poorer classes and later becoming epidemic with all classes. There are several varieties of the plague, the most common one being known as Bubonic plague, the *septicæmic* plague which is a type of blood poisoning being more severe if possible than where the glands alone are affected. The third type recognized is the so-called *pneumatic* type in which the lungs seem to be affected more seriously than the rest of the body and death is usually the result of this type. A fourth one known as *pestis minor* occurs where either the resistance by the patient is very great, or in the conveyance of the germ its virulence has been attenuated so that the disease is simply strongly suspected. It is now thought possible that vaccination against the disease which is in line with the vaccine therapy and which has been so notable in smallpox, will reduce the mortality of plague to somewhere in the neighborhood of twenty or twenty-five per cent, although before any of the recent measures were undertaken, the disease was usually mortal, at least eighty-five or ninety per cent dying in its course. The method of prevention beyond this one of vaccination is, of course, a systematic system of prophylaxis. In India, for instance, they aim to limit the propagation of rats, which was the method employed by the commission to clean up San Francisco when the plague obtained its foothold there. The number of rat traps in India amounts to two per cent of the population according to Liston. The habits of the rat are studied and the carrying out of systematic rat trapping is very thorough. Next is the disinfection of clothing and all paraphernalia carried by travellers. Fleas which have left sickly rats are supposed to carry the infection to new localities through the mediumship of human beings. Cats are bred as one of the ready means of limiting the plague in addition to trapping the rat. Quarantine has never seemed an efficient check to the disease although this was one of the first measures taken, and now in addition to the extermination of rats and mice, hygienic measures are taken in regard to the sewerage, drinking water and dwellings. The protective measures above alluded to by vaccination may be again referred to to report one unfortunate affair which has caused much antagonism in the Eastern countries. Because of its great success, many people had allowed the inoculation to be used, but after one incident when lockjaw developed in nineteen people and all died, practically all the good formerly obtained by the confidence in its use was vitiated, increasing the aversion of the natives, who in their ignorance could not understand the great good it would accomplish.

Symptoms.—The disease shows itself in from two to ten days after exposure to some other being that is ill. The first symptoms start within one or two days, and in addition to dizziness, profound muscular weakness and pallor are accompanied with nausea, vomiting and diarrhœa. Nose-bleed often occurs, severe headache and occasionally

chills. The fever rapidly becomes very high, even reaching to one hundred and seven degrees. At this stage, the disease appears like a serious type of typhoid fever that has been in existence two or three weeks, although all symptoms are very serious and out of proportion to the duration of the disease. Within two or three days the swellings throughout the body begin, those of the groin occurring in the majority of cases, those in the axilla or armpit in about half the cases and the neck and jaw in relatively few, the swellings or inflamed glands reaching a size from a pigeon's egg to that of a lemon. If the glands break down and discharge pus, the outlook is thought to be more favorable than though they remain hard until a local death or gangrene of the part has occurred. The disease, as will be noted, is one of great severity, quick onset, and if recovery is to take place the height of the disease has been reached within a week or so. This description is one of the more common type, the other being associated with more prostration possibly and a longer convalescence.

Treatment.—Unfortunately, there is no remedy as yet discovered for a cure of this trouble. Nothing can be done except to ameliorate the symptoms. Cold sponging as would naturally be done in any continued fever, is of great comfort to the patient, purging is recommended by some and if this helps to check the vomiting, one good has been accomplished, but as the cause of the disease is circulating in the blood, practically nothing is at our command except measures to support the strength and give sufficient nourishment to tide the patient through should his vitality enable him to overcome the disease, and then, as above noted, about eighty to ninety per cent of the cases will die. One observer in Hong Kong reported great success by the internal use of carbolic acid. This treatment would not be recommended except under the careful observation of a competent physician owing to the danger of carbolic acid poisoning, but as many cases seemingly were helped by its administration, Thompson considers this the most important contribution to the cures advocated that he had met. It may again be noted, therefore, that measures to prevent the occurrence of the disease, either by anti-toxine injections for immunizing or the limitation of the methods of infection are the strongest weapons we have at present in fighting this dread disease.

Hookworm.

Hookworm (Uncinariasis Anchylostomiasis) known as Egyptian Chlorosis. This disease while formerly found only in tropical climates is now found in so many regions that no country appears to be exempt. It has been found in all of the continents, especially lower Europe, West Indies and lately our Southern States are adding to the increased account. One authority claims that it is so rare to find it north of the Potomac River that the disease may practically be ignored but as an occasional case breaks out in the northern climate, the disease must be

considered as at any time possible to command attention. The infection is caused by different varieties of the uncinariæ and is found in man and beast. In the normal climates, it may be even of more serious concern than cholera. In fact, in India it is said that three-quarters of the population are affected and it has been known in Egypt for thousands of years.

Causes.—The worm which causes the disease thrives in filth and the method of infection is usually by the medium of water or food, sometimes direct ingestion of contaminated earth either on vegetables or fruit or by means of hands causes the disease and direct infection either of the skin or by the worm is a possibility. In those countries where dirt eating is common, this disease makes its greatest ravages. The animals or parasites working in the system, and of course, more or less in the intestines cause a constant increase in the infection and the discharges from infected people come in contact with vegetation or drinking supply of people not already affected. It was found on experimentation on dogs that the worms would find their way into the intestines as quickly by skin inoculation as when the method was used by the mouth. Here again, as in other tropical diseases, prophylaxis is of far greater importance than trying to cure the disease after it has got an inroad on the patient.

Symptoms.—The disease is marked by the one great symptom of intense anæmia or paleness. This depends upon the condition of the patient either when first taken by the disease or later after several years' attack with the worm, together with the number of worms that have multiplied in the body. It has even been suggested that the hookworm of today is not as destructive to the welfare of the body as in olden days, in fact if but few worms are present in the body, the general symptoms may be very mild; but in any case of pronounced anæmia without good evidence that a direct cause may be assigned, such as hemorrhages, which would cause secondary anæmia or constitutional diseases in the blood, it is well to investigate the hookworm. Together with this intense anæmia which is always present in cases of long-standing or large number of worms, two prominent symptoms stand out directing our attention to the digestive tract. These are pains in the bowels together with the general symptoms of indigestion or dyspepsia and later on, swelling of the extremities. The appetite is usually diminished but the pain that is present may be relieved by food for the time being. The destruction of the red blood globules causes symptoms characteristic of the anæmia no matter what the origin. There is shortness of breath, distress on exertion, great weakness of the entire body, dizziness and usually ringing of the ears on any exertion. The growth of the patient will be retarded if young and while there is very little wasting of the adult, yet the appearance of the white mucous membrane together with the thin and undeveloped extremities causes the picture to be one most marked. The diagnosis of this disease in a

patient stricken with a pronounced and increasing anæmia should be confirmed by an examination of the fecal discharges. It is said that the disease most often mistaken for it is malaria, but examination of the blood in malaria and of the feces in the hookworm will clear that up quickly if a microscope is used. A helpful sign recently advanced is the occurrence of black or blue patches on the back of the tongue, and it is said to appear very early and in practically all of the cases.

Treatment.—The treatment of uncinariasis is now made efficient by two drugs; thymol is given in doses of thirty grains repeated in two hours. Although this drug may occasionally cause dizziness and temporary irritation of the kidneys yet it is so valuable in the treatment of this disease that the temporary discomfort may be ignored. Patients in whom the diagnosis has been confirmed by a microscopic examination are put on a liquid diet for one or two days and the bowels prepared for a thymol medication by a purge of epsom salts the night before. No drug should be used in connection with thymol as poisoning may occur if it is absorbed into the system. This precaution is necessary as no alcohol in the form of wines or stronger liquors should be taken either with or in close proximity to a dose of thymol. Again to prevent poisoning a dose of epsom salts should follow the use of thymol, and no oil such as castor oil or sweet oil should be used at all.

Pallagra.

Pallagra.—Is a disease that has been recognized for many years in Europe and the Southern countries of Egypt and Algeria, later making its appearance in North America, mostly in the Mexican countries and still later an occasional case has been reported in the United States. Within more recent years it has worked its way into the United States in greater numbers, and today is one of the diseases which has to be considered in the investigation of more recent diseases that are swelling the death rate.

Cause.—Formerly all cases were supposed to have originated from the sufferer eating decomposed or spoiled maize in one form or another. It is not known exactly how the poison which is formed in this manner acts, but whether used in the form of food or drink the resulting symptoms are the same.

Symptoms.—The three parts of the body that are most commonly affected are the food tract, the skin and the nervous system. Beginning with a general *malaise* or restlessness and tired feeling with inclination to vomit, diarrhœa and other general symptoms of a severe dyspepsia, the rest of the alimentary tract soon becomes involved, the tongue becomes swollen and sore, the mouth becomes red and ulcers are left both in and around the mouth. Rash appears on the body followed by desquamation or peeling. In some instances blisters form leaving raw surfaces which are very slow to heal, becoming dry,

scaly and discolored. There is pain in the head and back, loss of sleep and later on spinal and nervous symptoms are very pronounced. These symptoms are quite a time in making themselves manifest, and should the summer season appear in the midst of the symptoms they seem to diminish in intensity until fall comes on, when the reappearance of the disease is announced by greater intensity of all symptoms, and as time goes on more marked nervous symptoms appear. These are manifested by paralysis of the legs, the arms being usually not affected. The muscular structure of the legs wastes away and the joints are liable to become stiff and contracted. The skin itches and burns, and after a period of some years a considerable number of victims become insane with a chronic type of insanity that is never recovered from. In the acute course which the disease sometimes takes, death may occur within relatively few years, but there is a chronic type which lasts from twenty to twenty-five years. There is usually an associated meningitis in the later stages which is the primary cause of death. In cases that have persisted over some years there is marked pallor and anæmia with great wasting of all parts of the body. The patients look old before their time in every portion of the body, losing their hair or else turning gray, their arteries becoming hardened, the skin wrinkled, changes in hearing and sight occur, and in fact all signs point to premature old age.

Treatment.—Like so many of the more recent diseases that have made their appearance in the United States but have been known for years in more ancient countries where medical investigation is either not carried on so scientifically or with less interest at heart, there is no known specific for the cure of the disease. Prophylaxis is of greater importance, and if the people can be educated to a fear of the danger of eating decomposed maize and rigid inspectorship provided for all grains that are to be used as an article of food much good will have been accomplished. With the direct treatment of the disease beyond the prohibition of any food such as maize or corn entering into its composition and the total prohibition of alcohol in any form, which, of course, is obtained from the grains, we have little at our command except the stimulants and drugs such as quinine and arsenic from which good results have been reported. The skin symptoms are treated with ointments and lotions to keep the skin soft and moist. Sea bathing has been advised for the general tonic effect with massage and electric treatment together with the above-named drugs to keep up the general health.

OLD AGE AND ITS DISEASES.

The Changes occurring in Advanced Life.

GROWTH, maturity, and decline are the three periods which divide and measure human life.

During growth, the deposit of new matter takes place more rapidly than the decay or waste which is also going on.

During healthy maturity, waste and increase are exactly equal, the one taking place just as rapidly as the other.

The decline of old age reverses the order of growth, and waste outstrips addition. The newly deposited matter comes, but not so rapidly as the old is cast away.

Declining Age may be said to extend from fifty to sixty.

Incipient Old Age from sixty to seventy.

Ripe Old Age from seventy to eighty.

Decrepitude or Second Infancy from eighty to the end of life.

Preservation of Old People's Health.

It is proper here to speak of the *hygiene* of old age, or the means of *preserving* aged people's health.

It is natural to desire a continuance of life; and except in the case of the extremely old, there is a general wish for its prolongation. Those who are born of parents who have lived long, are more likely to attain length of days than those who have descended from short-lived ancestors; yet the influence of correct habits may add quite as many years to their lives.

Regular Habits.—The old feel the evil influence of irregular habits much more than the young. It is seldom that any *change* of habit, long indulged, is well borne by the aged. So true is this, that the attempt to correct some habits of evil tendency is sometimes

dangerous to the old, so much have they lost the power of adapting themselves to change. The discontinuance of the habitual use of spirit, or tobacco, or opium, by an old person, though the use of either is of acknowledged evil tendency, will frequently prove fatal. It is almost necessary that the habits of the aged should remain as they are. What an impressive lesson this fact gives the young on the necessity of forming good habits in early life!

Even the hours of taking meals should not be changed in the decline of life. Removing to new climates, and forming new social relations by those advanced in years, is not favorable to length of days. Old trees do not often take root and live long when transferred to a new soil.

Diet. — The food of old people should of course be easy of digestion. It is often the case that they bear made dishes such as “hash,” so called, better than plain boiled or roasted meat. This can only be explained on the ground that the meat is chopped fine, and is more thoroughly cooked.

Mode of Cooking Meats. — This leads me to speak of the best methods of cooking meats so that they may be tender.

The flesh of all warm-blooded animals is identical in composition with that of human beings. That the flesh of animals used as food, therefore, may form flesh in the human body in the easiest manner, none of its essential constituents or parts should be taken from it during the process of cooking. If any one of its constituents is extracted, it will no longer be *like* human flesh; and that lost part will have to be resupplied before it can become a part of the frame of man.

Flesh is composed of two parts—that which can be dissolved, and that which cannot. The separation between these two parts is more or less completely effected in boiling, according to the amount of water used and the length of time employed in the process.

In making soup, we have no objection to a separation between the hard and juicy parts of the meat, because the latter passes into the water and helps form the soup. Hence the proper way is to put the meat into cold water when it is put over the fire, and let it come to the boiling point very gradually; during which time the juicy part has a chance to dissolve out, and, uniting with the water, make rich soup.

But when the meat is to be boiled simply, and eaten as boiled meat, we should aim to retain the juice within it, that we may retain the whole of it. To do this, we must put the meat into water which is briskly boiling over the fire. The juice of the meat contains a large quantity of *albumen*, a substance just like the white of egg; and putting the meat suddenly into boiling water almost instantly hardens this albumen all around the surface, just as boiling water hardens white of egg, and this prevents all the juice of the inner portion of

the meat from running out into the water and being lost. Keep the meat in the briskly-boiling water a few minutes, then pour in a little cold water to reduce the temperature slightly, and keep it in this somewhat reduced temperature until it is done through.

Broiling and roasting are pretty generally understood, and are done well enough where persons are disposed to take pains. Frying is an abomination, and should be banished from all civilized households.

Milk is an excellent article of diet for old persons. Except in some few cases where it disagrees with the stomach, it is among the very best. Sometimes, when it disagrees with a weak stomach, a little lime-water added to it will make all right. Artificial ass's milk, which will generally sit well on aged people's stomachs, may be made by dissolving one ounce of pulverized sugar of milk in one pint of skimmed cow's milk.

Potatoes, beets, carrots, parsnips, and asparagus are healthful; peas, beans, cabbages, etc., had better not be largely indulged in.

Ripe Fruits, taken in moderation, are useful; but should be eaten at meal-time, not between meals. Among these, ripe apples, pears, peaches, plums, strawberries, currants, and grapes are luxuries in which not even the oldest persons need fear to indulge to a reasonable extent.

Plain Puddings and Pies are not entirely objectionable; but all rich and high-seasoned articles of pastry should be strictly rejected by the old, as they should, in fact, by all classes.

Wine, etc. — If any persons in the world may indulge in a little wine for their stomach's sake, it is the old. But even they, if they have not been accustomed to its use, often get along very well without it; and when they can do so it is better, for various reasons, especially that their example may have a good influence with others. When the feeble vitality of the aged seems to require it, especially if they have been in the habit of leaning upon it, they should be encouraged to use it. And if they chance to be poor, and cannot procure it themselves, for friends to withhold it from them on the ground of economy, or from the feeling of grudging stinginess, is nothing less than inhumanity and cruelty.

To these remarks upon diet, I add: the old should never eat to excess or repletion. They should eat slowly, and chew their food very thoroughly.

Susceptibility to Cold. — Aged people suffer very much from cold hands and feet, and, indeed, from languid circulation and low temperature generally. The heart, like all their other muscles, has become feeble, and sends the blood very lazily along the arteries. The clothing of the old should be thicker and warmer than that of younger people. We must prevent the escape of what little animal

heat there is by flannel worn next to the skin, and by woollen clothes generally — they being bad conductors of heat. Unless very fleshy, they seldom suffer from heat, even when their flannels are continued through the summer.

It is during winter nights that the old are apt to suffer most from cold. On going to bed, therefore, they should be warm; and on very cold nights should have a hot-water bag at their feet. The communication of animal heat, particularly from the young, is better even than this to support the vital energies of age; and some writers have recommended that the vital warmth of the old should be kept up by letting the young of our own species sleep with them. The humanity of this suggestion is very questionable. The aged would doubtless be benefited by such a proceeding; but the young would be injured. Whatever vitality should be gained by one would be lost by the other. While a few might be added to the limited days of the aged, many would be quite as likely to be subtracted from those of the young. I would much sooner recommend that old people attach to themselves, and take to their bed, an affectionate, clean, and silken-haired English terrier dog. Such an animal, usually as clean as a child, would impart warmth and vitality at night, and be a true, affectionate, and amusing companion during many a lonely hour of the day. Whatever may be said against this recommendation, — and of course some over-nice people will object, — I insist that it is in every sense far more proper than the expedient adopted with King David, when he “was old and stricken in years,” and after “they covered him with clothes, but he gat no heat.” (1 Kings i, 1.)

Mortality in Cold Weather. — Far more of the old people die in winter than in summer, or, indeed, in any other season. For this reason, old people should be very careful how they expose themselves during the coldest days of the winter.

If there be any change which the old are likely to bear with impunity or advantage, it is from a cold to a warm climate in their latter years. The wealthy Romans, when they grew old, were taken to Naples.

Care of the Skin. — Attention to the skin, always important to health, is very essentially so in the latter years of life. The scarf-skin of the old tends to become dry, and peel off. This may be prevented in a great measure by regular washing with tepid water, and rubbing. If the bath cannot be endured, not even the sponge-bath, let friction alone be employed. For friction, either the naked hand, a piece of flannel, or the flesh-brush may be used. In rubbing the belly, the hand should follow the course of the large bowel; that is, in the region of the stomach pass across from right to left, down on the left, across on the lower parts of the bowels, up on the right, etc. By this method, constipation and a windy condition of the stomach and bowels may frequently be removed, or rendered less distressing.

Exercise. — Always important, in all periods of life, exercise does not lose its advantages in old age. But the aged should always exercise with moderation. The violence used in youth would break the bones, and do various kinds of mischief were it indulged by the old. Carriage exercise is very suitable for old people, but the more active exercise of horseback riding, walking, and even working in the garden, should not be omitted — bearing always in mind that great fatigue is injurious.

Sleep. — Aged people should get about as much sleep as nature asks for. They should retire early, and not be in haste to rise with the dawn. They require more sleep than persons in middle life. Eight or ten hours in the twenty-four is not too much.

Sleeplessness. — Though the old require a good deal of sleep, it is unfortunate that many of them can sleep but little. A large proportion of persons far advanced in life, complain of inability to sleep. Many old people deceive themselves, and really sleep much more than they are aware. Yet they often persist that they sleep none at all, night after night. Their case is illustrated by an old lady whose doctor entered her room and found her sleeping very soundly and comfortably. The noise of a person entering the room awoke her soon after, when, rubbing her eyes, she turned to the doctor, and said all she wanted was sleep, that she had slept none for a month; and unless he could give her something to bring sleep, she must die.

Medical art, I am sorry to say, frequently fails to bring relief, when there is real want of sleep. Narcotics should always be avoided if possible. They do too much mischief; yet it is necessary, sometimes, to resort to them. Much may be done sometimes by taking an earlier or a lighter supper. Early rising, and exercise in the open air, will often bring sleep at night. Occasionally a glass of wine, or a little spirit of any kind, taken just before retiring, will bring the needed sleep.

Electricity. — In connection with sleep, the disturbing and the tranquilizing influence of electricity and magnetism has received some attention within a few years. A German philosopher contends that terrestrial magnetism exerts on persons of a sensitive organization a very soothing influence, when placed in proper relations with its currents, and a disturbing impression when otherwise situated. He cites cases to show that lying from east to west is so intolerable that persons of delicacy cannot endure it; while the horizontal position from north to south, with the head south, is *more* agreeable: and *most* agreeable and tranquilizing with the head to the north. A German surgeon is mentioned in Reichenback's Memoirs, who always woke early in the morning, and turning his head where his feet had been, invariably fell into a sound slumber, which was more refreshing than that of the night. When he chanced to omit this, he felt ill all day. Observing that the head of his bed was directed to the south, Reich.

enback persuaded him to turn it to the north; and ever after he slept soundly till the proper time to rise in the morning.

Without pronouncing upon the correctness of this theory, I will simply say that in my winter residence in town, the head of my bed is to the south. I sleep *tolerably* well; but *not* as well as at my summer residence a little out of town, where the head of my bed is towards the north. How much the stillness of the country and the greater purity of its atmosphere may contribute to this difference, I will not pretend to decide.

Medical Treatment of the Old.

IN prescribing medicine for old people, we should bear in mind the difference between the sexes. Women in advanced life are less excitable, and enjoy better health, frequently, than in early life. Old men, on the contrary, are more nervous, in their latter years, and consequently more easily affected.

The physician cannot rely on the *reaction* of the system in old age. He must do more by his remedies, and depend less upon nature to help him out of straits.

Larger Doses. — The torpid condition of the system in old age frequently requires larger doses of medicine to make an impression.

Fluid Medicines. — Pills and powders sometimes pass through the stomach and bowels in the same state in which they entered. Fluids are more readily appropriated — especially when the more active medicinal ingredient is mixed with wine, or some stimulating tincture, or aromatic water. These things rouse up the torpid stomach and bowels, and cause the medicine to take effect.

Medicine by Rectum. — When the disease is situated in the immediate neighborhood of the lower bowel, as the bladder, etc., it is sometimes better to administer the medicine by injection into the rectum.

Suitable Medicines for the Old. — The acids, the alkalies, and the neutral salts are unsuitable to be administered much to old people. All metallic medicines must be given sparingly, and with caution. Iodine and iodide of potassium are not very well borne. Narcotics must sometimes be used to some extent. Harsh and drastic purgatives are out of the question, except in some few instances in which they may be given sparingly in connection with compound tincture of gentian, or some other stimulating tonic. Sulphur is a valuable

remedy for aged people. So are the stimulant tonics, bitters, astringents, gum-resins, balsams, etc., together with the various carminatives, as anise, coriander, fennel, cascarrilla, ginger, etc.

Surgical Operations.—Some of the smaller operations in surgery need not be forbidden in the case of the old; but great operations are not to be thought of. There is not recuperative power enough to bear them.

Diseases of the Old.

MOST of the diseases which afflict aged people are of course much the same as those which come upon people at all periods of life. These having all been treated of in the previous pages of this book, do not require to be gone over particularly again. There are a few complaints, however, which are peculiar to the old, of which I must briefly speak.

Bronchial Flux. — *Bronchorrhœa*.

A MORE than usual amount of mucous expectoration, accompanied with cough, is very common with old people — so common that in many cases they think very little of it, even when the expectoration becomes very profuse. This discharge, however, from the mucous surface of the bronchial tubes, is very apt to be attended by shortness of breath on making even very slight exertion; and the whole trouble is aggravated in damp weather, and by constipation, and the stoppage of leucorrhœa in females, or the interruption of insensible perspiration through the skin.

Slow progress. — This complaint makes very slow progress, as a general rule, often continuing many years without doing any great mischief. It is apt, however, to degenerate into a mischievous condition in the end; and should, therefore, as a general thing, receive some attention.

Treatment. — Attend carefully to the skin. Keep it in as healthy a condition as possible, by regular and faithful bathing and friction. This is of prime importance.

Care must be had not to suppress the discharge too suddenly. It may be necessary, at times, to use some expectorant (see expectorants among the prescriptions) to make the raising easier. But when it is thoroughly loosened up, we should begin to suppress it by astringent inhalations. For this purpose Astringent Inhalant on page 274 is excellent. It might be well, however, to begin with the Anti-Hemorrhagic Inhalant on page 274, which is slightly styptic.

Removal to a *dry* climate is a valuable remedy, provided the climate is not too hot, and is healthful in every other respect.

Other Diseases. — The other diseases with which old persons are afflicted are so common to all ages, that I do little more than name them, adding a few general remarks.

Asthma. — The asthma, or intermittent difficulty of breathing of the old, is connected with various other troubles, as chronic inflammation of the bronchial tubes, air in the lung-tissue, swelling of the lungs, enlargement and dilatation of the heart, and diseases of its valves, etc. It is also dependent on impurities of the blood, and is connected with torpid action of the kidneys. It is impossible, sometimes, to say which of these conditions it is dependent upon. As far as may be, however, the cause must be searched out; and then, while the general remedies for asthma must be employed, the particular thing with which it is connected must also receive attention, especially if it be connected with derangement of the kidneys.

Asthmatic old people are almost always dyspeptics. The stomach and bowels, therefore, require particular attention. The warm purgatives, combined with alkalies, are generally useful: as rhubarb and soda, equal parts, or Mettauer's Aperient, with a little tincture of ginger or tincture of cayenne in it. A very valuable preparation is compound tincture of gentian and tincture of calumba, two ounces each, one-half ounce of tincture of ginger, and half an ounce of bicarbonate of soda. Mix, and take a teaspoonful as occasion may require.

Apoplexy and Paralysis. — The nervous system being weakened in aged people, the way is opened for greater frequency of attack from apoplexy and paralysis. The exciting cause may be hyperæmia, too much blood; or anæmia, too little blood. It may be general debility, or gout, or a poisoned state of the blood.

The treatment is to be conducted much on the same principles as when these diseases occur in younger subjects.

I pass over numerous complaints which may be said to be somewhat more common in advanced life than at earlier periods. They are so fully treated in previous pages of this book, that it is deemed needless even to name them here. There is, however, one other class of diseases occurring so very often in old age, and in so many cases making advanced life a burden, that I cannot pass them wholly in silence. I refer to

Diseases of the Urinary Organs. — These afflict the old, not only very commonly, but very severely. A man who reaches the age of seventy or eighty without experiencing some serious trouble from deranged kidneys, diseased bladder or prostate gland, or gall-stones, or gravel, or unhealthy urinary deposits of some sort, may think himself greatly favored.

Treatment. — It is not necessary here to go over the whole ground of treatment. That is done in other parts of the book. I will say,

however, that a surgical operation for stone in the bladder is not often to be thought of in the case of old people. Other remedies must be sought. And among these, none hold out so good a chance of relief as the free drinking of the alkaline bicarbonates dissolved in water. This will frequently dissolve stones formed of uric acid, urate of ammonia, and triple phosphates. Poland water in large quantities is good.

Indican in the Urine.

The determination of the relative amount of *indican* present in the urine has come to be regarded, by physicians at large, of extreme importance as indicating the quantity of poisonous material which is being thrown back into the system.

Nature.—Indican is formed from *indol*, which is a product of the putrefaction of albuminous substances, and which after being absorbed into the system is chemically changed or oxidized and eliminated by the kidneys.

Importance.—As putrefaction is constantly going on in the normal intestine, save in that of the newborn, indican is present in the normal urine, the amount found in the adult varying from .0025 to .005 gm. in the twenty-four hours, when the diet is mixed. A milk diet will show a very small amount; while a diet composed generously of meats shows the largest amounts excreted in health. An excess of indican shows that there is putrefaction of proteid substances going on somewhere in the body to an abnormal degree. This may take place (1) outside of the intestines, as in such conditions as putrid cancer, tuberculous cavities, gangrene, pus in the lungs, etc. In all these conditions the indol which is formed is absorbed directly into the blood and excreted as indican; (2) in the intestines themselves (and this constitutes by far the larger number of cases) indican is increased by any of the various conditions which increase intestinal putrefaction, or by obstruction to the free passage of food through the intestines, such as “knots,” peritonitis, appendicitis, tuberculous and typhoid ulcers, paralysis of the stomach or small intestine, lead-poisoning, cholera, etc.

But it is because an excess of indican is the surest sign we possess of auto-intoxication — that great generator of every sort of human ill and the despair alike of the physician and his patient — that it is of most importance.

Test for Indican.—Indican is a colorless, syrupy substance, very soluble in water, alcohol or ether, and having a bitter taste. It is converted by heat and acids into indigo-red or indigo-blue according to the amount present. Into a wine glass pour 1 drachm of pure

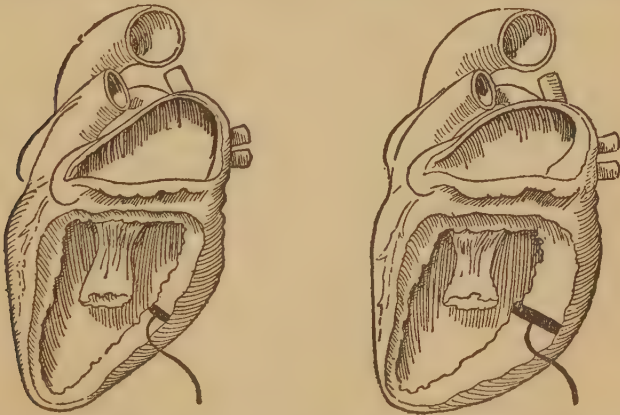
hydrochloric acid, and add one or two drops, never more, of pure nitric acid. Now add 15 drops of urine and stir; in from 5 to 20 minutes a distinct bluish-red or amethyst color appears, of a light shade if the indican is diminished, and perfectly distinct if the amount is normal. On the other hand if a reddish-blue or violet color appears the indican is increased (roughly speaking in proportion to the rapidity at which the color appears). See Plate. Opp. pp. 372.

Constipation.—Recent investigations show that constipation especially if chronic, may be the *sole* cause of an increase in the amount of indican. Astringent drugs will quickly increase the amount formed; while in simple diarrhœa, and even in typhoid accompanied by severe diarrhœa, an increase of indican is rarely found. On the other hand, in false diarrhœa in which there is retention of the feces a large amount may be discovered in the urine. In these cases purgatives like castor oil will cause an immediate diminution of the indican. Those who live “high,” or on a diet rich in proteids, are apt to secrete a urine showing an excess of indican.

The Liver.—Whenever the flow of bile is impeded or diminished intestinal putrefaction, and consequently indican, is increased, since the bile acts not only as a stimulant to intestinal action, but as an antiseptic.

Treatment.—Appropriate dieting measures will usually relieve the urine of its excessive burden of indican. If it does not, the patient should submit to a thorough examination to ascertain from which source the indican is derived.

Diagrams of Heart in Youth and Old Age.



On the Left, the Heart of a Full-grown Person, Showing the Normal Thickness of the Walls. On the Right, the Heart in Old Age, Showing How the Walls Become Thickened and the Whole Organ Enlarged.

ACCIDENTS.

Apparent Death from Noxious Vapors.

WHEN persons become insensible from breathing foul air in a deep well or other place where it collects, let them be immediately exposed to the open air, cold water be sprinkled upon the face and head, and strong vinegar be rubbed about the nostrils. As soon as there is ability to swallow, give some drinks, as lemonade, or a few drops of aromatic sulphuric acid, dropped into a tumblerful of water, and slightly sweetened. A stimulating injection (246) may be given.

Apparent Death from Burning Charcoal.

SOME persons very thoughtlessly attempt to warm their sleeping or sitting rooms with a portable furnace, or open pan filled with burning charcoal, or live coals from a wood fire. This is very wrong, as such coals while burning throw off large quantities of carbonic acid gas, a deadly poison. This being heavier than atmospheric air, falls to the bottom of the room, and for a time may do no damage; but, if there be no chimney-draught, or open door or window, it will rise above the heads of those in the room, and bring on asphyxia and death.

Let such cases be treated the same as the preceding, with the additional measure of attempting to excite breathing, as in the case of persons apparently dead from drowning.

To Recover Persons Apparently Drowned.

OF all the sad accidents that may often be avoided by a knowledge of their prevention, drowning seems the most lamentable. Its occurrence, too, is the most frequent. A knowledge, then, of how to restore the drowning to life, and to renew the suspended animation, is equally important to people as a knowledge of how to swim.

Drowning persons die by what is called *asphyxia*. The air being shut off from the lungs, breathing stops, and the immediate accumulation of carbonic acid in the blood paralyzes the nervous system, and insensibility immediately follows. The heart continues to beat, however, from five to twenty minutes after the occurrence of insensibility and apparent death.

ASPHYXIA. The best form of artificial respiration to use, in case of asphyxia, is what is known as the "prone-posture", or **SCHAFER'S** method. This consists in placing the patient face down, with the head turned to one side, and the arms beside the body. (Fig. 150). Kneeling astride the patient's thighs or to one side of the patient, place the two hands over the lower chest wall, with the heels of the thumbs toward the spine, and the fingers spread outwards around the ribs. By pressing down and squeezing the chest walls with the hands, the air is driven out from the lungs, also any fluid or other foreign substance that may be blocking the air passages. The pressure is then removed, when the natural elasticity of the lung tissue will cause inspiration to take place. These movements should be made 14 or 15 times per minute.



Schäfer's Prone-Posture Method.

SYLVESTER'S method (Fig. 151) in which the patient is placed on his back, and the arms brought outward from the sides, up, and across the chest, finally pressing them hard against the chest to expel the air, when the process is repeated, has the disadvantage of not draining the respiratory passages. A very useful method is that devised by **LABORDE**, in which rhythmic traction is made on the tongue. The end of the tongue is seized between two folds of cloth, and pulled well forward and upward, from 10 to 14 times per minute, until voluntary respiration takes place.

In all cases treated by the last two methods, it is important to pay particular attention to the position of the head. When a person

lies on his back there is a tendency for the tongue to drop down into the back of the throat, thus shutting off the air passages. To prevent this, and afford a clear opening for the air to enter, and foreign substances to be expelled, the head and neck should be extended so that the latter makes an angle of 45 with the plane of the surface upon which the body is lying. Kneeling at the upper end of the patient, with a hand on each side of the head, palms over the ears, pass the fingers behind the angles of the lower jaw and press forward and upward, thus throwing the lower jaw forward, the head upward and backward, and elevating the Adam's Apple and the base of the tongue away from the back of the throat.



Artificial respiration by Silvester's Method. Upper figure, inspiration; lower figure, expiration.

Apparent Death from Lightning.

A **STROKE** of lightning will frequently produce asphyxia by paralyzing the muscles of respiration. In such case, the same means for recovery should be used as in apparent death from drowning. Or, the apparently dead person may be placed in a current of fresh air, and cold water dashed upon the face, neck, and breast, and warm friction be applied if the body is cold.

Apparent Death from Hanging.

PERSONS found hanging, who have committed suicide, are to be cut down instantly, and the same means employed to re-establish breathing as in cases of drowning. It may help to restore the breathing, to bathe the forehead and face with vinegar, or tincture of camphor, and to pass hartshorn frequently under the nostrils.

Clothes Catching Fire.

It is perhaps unreasonable to look for presence of mind when this frightful accident occurs, yet it is never more needed than at such a time.

The instant a lady perceives her clothes to be on fire, and *in a blaze*, she should seize the nearest large rug, cloak, blanket, coverlet, or any equivalent article, and, wrapping it *tight* around her, throw herself flat upon the floor, taking care to keep the protecting covering *close* to her until the fire is completely smothered. If she does this with energy, and effectually, she will put out the fire instantly.

If she continue on her feet, the blaze will rapidly ascend, and burn her vital parts. If she *run* to seek relief from others not present, the motion of the air will fan the flame into a swifter work of destruction.

If it be a child that is on fire, let any person present treat it as above. If it be badly burned before the fire is extinguished, put it instantly into a tub of cold water, or dash cold water upon it, to prevent the burn from becoming deep.

Accidents on the Water.

If upset in a boat, or otherwise thrown into the water, and not able to swim, draw the breath in well, and keep the mouth shut tight. Do not struggle and throw the arms up; but yield quietly to the water, hold the head well up, and stretch out the hands only *below* the water. To throw the hands or the feet *up*, will pitch the head *down*, and cause the whole person to go immediately under water. Keep the *head above*, and everything else *under water*.

Poisoning Accidents. — Antidotes of Poisons.

ACCIDENTS from poisons are of such common occurrence, that every person should know the proper remedies, and not be obliged to wait the arrival of a physician before the proper corrective is applied. The most common remedies, with the methods of applying them, will be given under the proper heads below.

Poisons may be classified under two heads: viz., mineral and vegetable.

In the treatment, three objects are to be kept in view: first, to get rid of the poison; second, to stop its action; and third, to avert its tendency to death.

The first indication is accomplished by the administration of emetics to cause vomiting, or by the use of a stomach pump. The simplest way to provoke vomiting is to give large draughts of lukewarm water, and to thrust a finger down the throat.

The term stomach pump was formerly given to a rubber tube which had a bulb about two feet from the end that was passed through the mouth and down the esophagus into the stomach. This had a syringe-like action and by suction drew the poison or other material out of the stomach. The term is now used for any tube which answers the same purpose, and any rubber tube three or four feet long with a diameter of one-half inch may be used with good results. The absence of the syringe bulb makes the use of a slightly long tube necessary, so that a siphon action can be attained by first closing one end of the tube and after filling with lukewarm water, the pointed end is passed into the stomach, usually requiring 18 inches of tube from the teeth. The longer end is then dropped toward the floor and the water will flow from the tube by a vacuum forming and removing the fluid from the stomach.

A teaspoonful or two of mustard in warm water is oftentimes an effectual emetic. Some of the emetics are ipecacuanha, tartar emetic, sulphate of zinc, and sulphate of copper. Sulphate of zinc in twenty-grain doses is about the best.

The second indication is to use an antidote. The third indication is fulfilled by palliating the symptoms, and neutralizing the after-effects on the constitution.

After copious vomiting, soothing liquids should be given, such as oil, milk, beaten-up raw eggs. These are useful when the poison has been of an irritating character.

If the patient be much depressed in mind or body, the hands and feet cold, the lips blue, the face pale, a cold perspiration on the forehead and about the mouth, some stimulant may be administered. Strong, hot tea is the best, because it is a chemical antidote to many poisons. Strong coffee is a good stimulant. Brandy and other spirits are sometimes necessary. Sometimes when the powers of life are much depressed, artificial heat also is necessary.

Mineral Poisons.

Poisoning by Ammonia.

WATER of ammonia, or hartshorn, if taken in an undiluted state, acts as a violent poison.

When this accident happens, give *vinegar* instantly, mixed with a little water. Vinegar is an *acid*, and ammonia is an alkali; acids and alkalies neutralize each other.

Poisoning by Antimony.

TARTAR emetic, and wine of antimony, are sometimes taken by accident in large doses, so as to act as poisons, and cause dangerous vomiting and prostration.

Give a tea of slippery elm, flax-seed, marshmallow, etc.; also syrup of poppies, paregoric, or laudanum in twenty-drop doses. To neutralize the poison, give a strong solution of tannin, or an infusion of oak-bark, or nutgalls.

Poisoning by Arsenic.

USE the stomach-pump instantly, if one is to be had; if not, give twenty grains of sulphate of zinc (white vitriol) in a little warm water; and promote the vomiting by filling the stomach with large draughts of warm or cold milk, sweetened water, or flax-seed tea. Or, vomiting may be induced still more quickly, by giving a large tablespoonful of strong ground mustard, mixed with a teacupful of water.

But the best antidote for arsenic is hydrated sesquioxide of iron. Mix a tablespoonful of this with water, and give this amount every five or ten minutes, until half a dozen doses are taken.

Treat the inflammation of the stomach which follows, by friction, a bland liquid diet, mucilaginous drinks, etc.

Poisoning by Verdigris, or Acetate of Copper.

COOKING utensils made of copper never ought to be tolerated; yet they are used; and it is from the verdigris which forms upon them that most of the cases of poisoning by copper happen.

Give an emetic instantly, and then two teaspoonfuls of carbonate of soda (baking soda) in a tumblerful of water, to be repeated in ten minutes. White of eggs diffused in water, and mucilaginous drinks, are proper.

Poisoning by Corrosive Sublimate.

THIS is the common bed-bug poison, and is often taken by mistake.

Mix up quickly the whites of a dozen eggs, with two pints of cold water, and give a glassful of the mixture every two minutes till the stomach can contain no more. If there are not eggs enough at hand, take what there are, and make up the deficiency with milk. Wheat

flour, mixed with water, is a good remedy. Use the stomach-pump, if it is at hand.

Poisoning by Sugar of Lead, or Acetate of Lead.

GIVE a ground-mustard or a sulphate of zinc emetic; then give diluted sulphuric acid, or either epsom or glauber's salts.

Poisoning by Strong Lye.

STRONG lye is sometimes swallowed by children. The remedy is vinegar, or oil. Vinegar will convert the lye into acetate of potash, and any of the oils will unite with it and form soap; and neither the acetate of potash nor soap will materially injure the stomach.

Poisoning by Nitric, Muriatic, or Sulphuric Acid.

WHEN either one of these acids is swallowed, not a moment of time is to be lost. Fill the patient *full* of calcined magnesia stirred up in water. This is the best remedy; but if it is not to be had, give half an ounce of soap in a pint of water. If neither are at hand, give chalk, or whiting, in water, or even pound fine some of the plastering of the room, and give it in water.

Poisoning by Nitrate of Potash, called Nitre, or Saltpetre.

INDUCE vomiting by lukewarm water, and by tickling the throat with a feather; but avoid irritating the stomach with the ordinary emetics.

Poisoning by White Vitriol.

PROVOKE vomiting by warm drinks, and by tickling the throat, and give freely carbonate of soda, in water.

Poisoning by Oxalic Acid.

THIS resembles epsom salts, and is liable to be taken for salts by mistake. The two can always be distinguished by touching a little to the tongue. Epsom salts taste *bitter*; oxalic acid, *very sour*.

In cases of poison from oxalic acid, give magnesia in water as quickly as possible. When this is not at hand, give chalk, or lime, or saleratus. Use the stomach-pump, if it is to be had.

Vegetable and Other Poisons.

THE vegetable poisons are quite numerous, and many of them quite as virulent and rapid as any in the mineral kingdom.

Poisoning by Aconite.

GIVE an emetic of ground mustard or sulphate of zinc, or use the stomach-pump instantly, and then give stimulants, as brandy, gin, whiskey, rum, etc.

Poisoning by Opium, Morphine, and Laudanum.

USE the stomach-pump, if at hand; if not, a powerful emetic of sulphate of zinc, or sulphate of copper; or, if these are not at hand, a tablespoonful of ground mustard in a teacupful of warm water. If vomiting is not induced at once, tickle the throat with a feather, or with the finger. If sleep is impending, take the patient into the open air, and keep him walking; dash water upon his face, etc. If he still falls into sleep, and appears to be near dying, apply means for artificial breathing as for persons apparently dead from drowning.

As a last resort the electric battery may be tried, as it has been the means of saving several persons who would have otherwise died. One sponge of the battery may be applied to the back of the neck and the other to the lower end of the breast bone. By the action of the battery on the phrenic nerve, a stimulus to respiration is caused, and involuntarily the patient may be made to breathe.

Poisoning from Belladonna, Hyoscyamus, Stramonium, and Conium.

THESE are all narcotics, and when accidentally taken in poisonous doses, the treatment is to be the same as for poisoning by opium. Strong coffee is said to counteract the effect of these articles.

Poisoning by Dogwood, Ivy, etc.

GIVE some of the salts as a cathartic, and apply to the skin a solution of sugar of lead, or still better, a decoction of witchhazel-bark or lime-water.

Poisoning by Prussic Acid.

THIS is the most deadly of all known poisons. One drop of the *pure acid* will cause immediate death. Give water of ammonia or hartshorn, one part diluted with six parts of water, freely.

Poisoning by Strychnine.

THE same treatment as for poisoning by opium, excepting that sweet milk should be freely administered. This has been recommended by one respectable physician, at least, who says he has found it to be a specific. Camphor, two ounces dissolved in a quart of whiskey, and given *freely*, is also said to be an antidote.

Poisoning by Spanish Flies.

GIVE large draughts of sweet oil, sugar and water, milk, or flax-seed tea. For the inflammation of the bladder which is produced and to relieve the strangury or scalding of the water, give camphor internally.

Ptomaine Poisoning.

GIVE patient a large dose of castor oil in lemon juice *at once*, and unless there is quick relief lose no time in calling a physician.

How to Lift and Transport the Sick and Injured.



Figure 1.

Kneeling on both knees, turn the patient flat on his face and stomach, putting the arms straight by his sides, take hold close under each armpit, raise the body as high as possible in that position, allowing it to rest on one of your knees. (See Figure No. 1.)



Figure 2.

With the patient's head on your chest shift your arm around his waist, interlock your fingers, lift the person to an upright position. (See Figure No. 2.)



Figure 3.

Then take hold of the patient's right wrist with your left hand, bringing his right arm around your neck, place your head beneath his body and drop into stooping position. Then pass your right arm between or around the patient's leg or legs, bringing the patient's weight well to the centre of your back. (See Figure No. 3.)

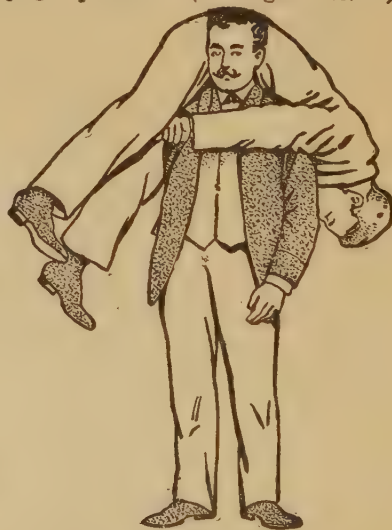


Figure 4.

Then grasp the patient's right wrist with your right hand, balancing his body on your shoulders, lift to the erect position. (See Figure No. 4.)

This is a very simple method and it would do well for every person to practice this, to be used in case of emergency.

IN EMERGENCY

What would You do

in the

Absence of a Physician?



This question and hundreds of others, dealing directly on your personal health are answered intelligently and plainly in the simplest language.

You are saved the danger of delay.

You are relieved of the expense.

You are saved embarrassment.

What Would You Do in the Absence of a Physician?

Sometimes it is a case of life or death. We can quote you many instances where lives have been saved by quick reference to the "Twentieth Century Medica."

What would you do if you were badly burned? See page 589.

What would you do for croup? See page 500.

What would you do if you were badly scalded? See page 589.

What would you do if overcome by noxious vapors? See page 560.

What would you do if your clothes caught fire? See page 563.

What would you do for a person if struck by lightning? See page 563.

What would you do if a person were brought from the water apparently drowned? See page 560.

What would you do if poisoned by arsenic, opium, or morphine? See page 565.

What would you do if exposed to smallpox? See page 160.

What would you do in case of sunstroke? See page 204.

What would you do if stabbed or shot? See pages 597 and 599.

What would you do in case of rupture of blood vein? See page 658.

What would you do in case of heart disease? See page 306.

What would you do if a person suddenly became insane? See page 222.

What would you do in the case of a gunshot wound? See page 599.

What would you do in case of an injury to the kneecap? See pages 612, 623.

What would you do in case of hemorrhage? See page 593.

What would you do in case of hiccoughs? See page 226.

What would you do in case of heartburn? See page 341.

What would you do in case of pleurisy or pneumonia? See pages 292, 296.

What would you do in case of hives? See page 164.

What would you do in case of hydrophobia? See page 208.

What would you do in case of inflammation of the bowels? See page 347.

- What would you do in case of cholera infantum? See page 504.
- What would you do in case of rupture? See page 638.
- What would you do in case of consumption? See pages 259-270.
- What would you do in case of stupor from opium poisoning or liquor, and how could you distinguish between the two? See page 192.
- What would you do in case of typhoid fever? See page 299.
- How would you prevent typhoid fever? See page 518.
- What would you do in case of measles? See page 156.
- What would you do in case of melancholia? See page 220.
- What would you do in case of nasal catarrh? See page 237.
- What would you do in case of nervous prostration? See page 224.
- What would you do in case of nettle rash? See page 164.
- What would you do in case of neuralgia? See page 216.
- What would you do in case of painter's colic? See page 355.
- What would you do in case of stroke of paralysis? See pages 205, 206.
- What would you do in case of inflammation of the eyes? See page 643.
- What would you do in case of cutting an artery, and how would you stop the flow of blood? See page 658.
- What would you do in case of lockjaw? See page 210.
- What would you do in case of cramps in stomach? See page 342.
- What would you do in case of asthma? See page 301.
- What would you do if freckled or sunburned? See page 175.
- What would you do in case of boils? See page 587.
- What would you do in case of abscess? See page 580.
- What would you do in case of colic? See pages 353, 504.
- What would you do in case of epileptic fits? See page 211.
- What would you do if bitten by a snake? See page 599.
- What would you do for a bad nose bleed? See page 654.
- If you were stabbed, cut, or wounded, how would you put on the bandage or dress the wound? See pages 656, 674.
- What would you do for cholera morbus? See page 361.
- What would you do in case of carbuncles? See page 588.
- What would you do in case of bronchitis? See page 237.
- What would you do in case of scarlet fever? See page 157.
- What would you do in case of hay fever? See page 303.
- What would you do in case of ague or intermittent fever? See page 522.
- What would you do for bed sores? See page 938.
- What would you do for canker? See page 498.
- What would you do for rheumatism or gout? See pages 525, 527.
- What would you do for Bright's disease? See page 371.
- What would you do for diphtheria? See pages 247, 533.
- What would you do for colored patches on the skin? See page 175.
- What would you do for St. Vitus' dance? See page 213.
- What would you do for ivy poisoning? See page 567.

- What would you do for cold in head? See page 253.
- What would you do in case of convulsions? See page 937.
- What would you do in case of chicken-pox? See page 162.
- What would you do in case of neuralgia? See page 216.
- What would you do to prove by symptoms that a person was dead?
See page 979.
- What would you do for a child when it is cutting teeth? See page 498.
- What would you do in case of constipation? See pages 144, 357.
- What would you do in case of tonsilitis? See page 250.
- What would you do in case of frost bite? See page 590.
- What would you do in case of blood poisoning? See page 474.
- What would you do in case of appendicitis? See page 349.
- What would you do in case of insect bites? See page 599.
- What would you do in case of child in fit? See page 508.
- What would you do in case of fracture of the jaw? See page 605.
- What would you do in case of gall stones? See page 332.
- What would you do in case of gastritis? See page 334.
- What would you do in case of ingrowing nails? See page 654.
- What would you do in case of rickets? See page 507.
- What would you do in case of ring worm? See page 180.
- What would you do in case of toothache? See page 664.
- What would you do in case of gravel? See page 378.
- What would you do in case of scurvy? See page 530.
- What would you do in case of dislocation of arm or ankle? See page 624.
- What would you do in case of cough or cold? See pages 143, 253.
- What would you do in case of whooping cough? See page 502.
- What would you do in case of sea sickness? See page 343.
- What would you do in case of mumps? See page 256.
- What would you do if bitten by a mad dog? See page 209.
- What would you do in case of shingles? See page 166.
- What would you do in case of suffocation? See page 560.
- What would you do in case of bleeding from the kidneys? See page 374.
- What would you do in case of delirium tremens? See page 191.
- What would you do in case of earache? See page 652.
- What would you do in case of sleeplessness? See page 227.
- What would you do in case of eczema? See page 166.
- What would you do in case of enlarged veins? See page 464?
- What would you do in case of foreign bodies in the eye? See page 643.
- What would you do in case of foreign bodies in the ear? See page 655.
- What would you do in case of stroke of apoplexy? See page 202.
- What would you do in case of broken arm or leg? See pages 607, 613.
- What would you do to stop spitting of blood? See page 1050.
- What would you do in case of dyspepsia? See page 336.

FLIES AND MOSQUITOES.



The Carriers of Infectious Diseases.

Flies Carry Disease and Death.

Flies are filthy insects. They drink from the cesspools, and dine in the privy vault. They eat the sputum on the sidewalk and revel in the garbage pail. The young **Flies** are maggots. They breed in stable manure. They breed in excrement of all kinds, in garbage, and in all sorts of wet and filthy refuse.

It is disgusting to read about such things. But is it not more disgusting to have these same **Flies**, after their repast of filth, drown in the milk pitcher, drop their specks on the frosted cake, or clean their feet on the bread? The **Flies** that very likely have just come from a neighboring



Fly Larvæ in the Stable Manure.
(Natural Size.)

privy may crawl over the lips of the sleeping baby, or gather on the nipple of its nursing bottle. Suppose the **Fly** that was fished out of the milk pitcher had just been eating the excrement of a typhoid fever patient or the sputum of the consumptive, would you like to drink the milk?

He was named last year the "typhoid fly" because he had been spreading typhoid by wholesale in army camps and elsewhere. The "fly" also transmits cholera, tuberculosis and various intestinal bacteria.

So he is also the "dysentery fly" having conveyed disease and

death to countless children. These are established facts. Remember that when and where absolute cleanliness prevails there will be no **Flies**. By all means do not let the **Flies** get near the milk. Do not let a **Fly** alight on the children's food or your own.



The sticky pads and claws of a house fly's leg, which carry infectious diseases. Magnified many thousand times.

To kill all the **Flies** in a room, put a spoonful of Formalin or Formaldehyde in a quarter of a pint of water and set where the **Flies** can drink it. A poison which is not dangerous to human life is bichromide of potash in solution. Dissolve one dram of the drug, which can be bought at any drug store, in two ounces of water and add a little sugar for sweetening. Expose this solution in shallow dishes.

If you have a stable keep the manure closely covered and have it removed often. Keep the yard and alley clean. Allow no refuse to accumulate anywhere.

The public are now fighting through the schools and boards of health these "germ" carriers, sometimes termed the most "dangerous animal on earth." Fight them continually and keep the home as free from them as possible.

Mosquitoes are a Nuisance and They Carry Disease.—They breed in pools of standing water, old barrels, tubs, cans, other hollow bits of rubbish, if they lie so as to hold water. They live near where they breed, and seldom go far away. You should drain the water holes, empty or upset the barrels and tubs, bury the cans and rubbish, and clear the gutters of your house.

If you can not drain the standing pools use kerosene. Sprinkle it over the surface of the water, about one quart to four hundred square feet once a fortnight. This will kill the larvæ of the **Mosquito**. Water for animals should be renewed every day.

Prof. William P. Seal claims to have found a breed of tiny fish which eat **Mosquitoes** with such greediness they will rid any neighborhood in which they are put of the malarial pest. He says, if people will cultivate the "*Gambusia Affinus*," a small fish now found on the South Atlantic coast from Delaware to Florida, they will soon be rid of the pest. A still smaller species of another genus, "*Hebranda Formosa*," about half an inch in length, is of the same general character. Both of these species are known as top minnows, from their habit of being at the surface and feeding there. They have protruding lower jaws.

Both are to be found in vast numbers in the South in the shallow margins of lakes, ponds and streams in the tide-water regions. They are also to be found in shallow ditches and surface water, even where the water is but a quarter of an inch deep. They find their food in the remotest possible breeding places of the **Mosquitoes** and eat the **Mosquitoes'** larvæ by the million.

SURGICAL DISEASES.

Modern Surgery.

To one educated in surgery a quarter of a century ago, the customs and theories of to-day must seem very odd, and the results of to-day's surgical science must seem truly miraculous. Formerly pus formation in a healing wound was regarded not only as unavoidable, but really beneficial. Pus, or matter, was known as *laudable* or good pus, and *diseased*, or bad pus. Wounds only occasionally healed by primary union or *first intention*,—that is to say, skin growing to skin and muscle to muscle as sewn, but they rather healed by a long, slow process of granulation attended with pus-formation, called *second intention*. The various surgical epidemics of contagious diseases were extremely common in the very best hospitals under the guidance of the very best men; they were thought unavoidable. Hospital gangrene, erysipelas, and the various forms of blood-poison diseases, were so common and spread so rapidly as often to render it necessary to close a hospital. Major operations were attended by a mortality that nowadays seems almost incredible. To amputate a leg, except under the most favorable circumstances, meant almost sure death. The late Dr. Pasteur of France first made known to the world that there were such things as germs, or microscopic life, capable of transmitting themselves and their spores almost endlessly. These germs were soon found to be the outcome of dirt and disease, and that possibly in their extermination lay a great future for surgery. It was Sir Joseph Lister, of England, who first discovered the fact that certain medicines, like carbolic acid, would kill these germs, and that in so doing wounds would unite by first intention in the majority of cases. This was the first great step toward the realization of the dreams of our forefathers.

The study of bacteriology was then commenced, and it has progressed rapidly ever since, till to-day it has become a marvelous science unfolding the life, nature and propagation of all sorts of bacteria.

We now know that on the living skin there exist normally certain germs whose function apparently is to use up the waste products of the economy, but which, when introduced into the flesh, produce most deleterious effects.

Germ-life is found everywhere, — on our hands and clothes, in the dust of the air and in the water we drink. So long as they keep to their natural abodes no mischief is done. It is this germ-life which causes wounds to suppurate, erysipelas, blood-poisoning and gangrene to occur. It is the annihilation of these germs about all wounds, and on all objects which come in contact with wounds, that distinguishes the *newer* from the *older* surgery. To-day the mortality figures are revised as regards all important operations. Regions of the body are invaded which fifteen or twenty years ago were thought to be inviolate to the scalpel. Thousands of lives are now saved and thousands of people rescued from becoming invalids.

The methods of treating germs have changed very materially since Sir Joseph Lister first announced his antiseptic treatment and showed the way to a new era in surgery; but the principles are much the same.

Some germs have been found to be innocuous, even on wounded surfaces; others are deadly poisons. Some germs cause one kind of disease, some another; some are even antagonistic to others. They are all endowed with great resistance to ordinary medicines and are capable of propagation under adverse circumstances; they are contagious and infectious, and when carried from one person to another cause their specific disease to start up. The so-called blood-poison is a general name for many distinct varieties of germ-disease.

It matters not whether a simple wound is to be dressed, a leg amputated or a woman delivered, the one essential thing above all else which protects life and allows the wounded surface to heal is to make a *clean* field, to render the surfaces *aseptic*.

Aseptic. Septic. — These are two terms which are daily becoming the common property of the laity: the former means *without poison, germ-free*, or surgically *clean*; the latter means *poisonous, germ-laden, surgically dirty*. Let it not be supposed that the flesh looks to the eye differently in these two conditions, — it is not so necessarily. These bacteria are so minute that if a single *rod-bacillus* were enlarged fifteen hundred times it would then only reach across the head of a pin. Nor is their virulence in proportion to their apparent numbers, for in twenty-four hours a single germ may multiply to sixteen and one-half millions!

Surgical cleanliness is surgical morality, and consists not merely in washing off the rough, visible, outside dirt, but in rendering everything which can possibly touch the wound, directly or indirectly, germ-free. This condition is called *asepsis*; when, however, germs have entered the wound and the consequent changes due to germ life have developed, then the condition is called *sepsis*.

Antiseptics. — The important and practical question then is, how are these germs killed and how is the wound rendered aseptic? Lister discovered in carbolic acid a germicide of no mean power, and

even to-day this acid is most extensively used for the cleansing of wounds and instruments. This process of killing germ-life is called *sterilization*.

After carbolic acid came numberless other drugs, such as corrosive sublimate, phenyl, sulpho-naphthol, etc. Of this group corrosive sublimate is by far the most potent: it may be used in very weak solutions as one part to three, five, or even ten thousand of water.

Heat. — By far the simplest, safest, and most economical method of sterilization is by means of heat, either in the form of boiling water, dry oven-heat, or steam. Whatever can be baked for an hour at 140° of heat, or whatever can be steamed for an hour, and whatever can be boiled five minutes without impairing the integrity of the object sterilized, can be rendered absolutely sterile. Germs and their spores, which latter are more tenacious of life than the former, yield readily to boiling water in a few minutes; while some germs of the most virulent type may soak for hours in a tolerably strong solution of the chemical sterilizers without being killed. The tendency of the present is to substitute these natural means of sterilization for the chemical germicides.

Antitoxins, Serums and Vaccines.

RECENT studies have resulted in great discoveries in Specific Therapy, as it is called. One method aims to assist the natural forces of the body in their struggle against invading germs; first, by applying "serums" which may be *antitoxic* or *antibacterial* in nature; the former being produced by repeatedly injecting perfectly healthy animals with increasing doses of the *toxin* or poison excreted by the germ, until there is developed an overwhelming number of *antibodies* or neutralizing products; the latter being made by injecting the germs themselves into animals. In both cases the resulting serum contains the antibodies of the germ in question. These serums are used in three ways: subcutaneously, which is the slowest method; intramuscularly, which is the one most often used; and intravenously, which is the most rapid method. In critical cases the serum is sometimes injected intraspinally.

Another method is by the injection of "bacterial vaccines," or "bacterins" as they are more properly called. Bacterial vaccines are sterilized, standardized suspensions of bacteria in normal salt solutions. They are sterilized by heating to 55 degrees or 60 degrees C. for one hour; standardized by counting; and preserved with cresol. They are administered subcutaneously, and the system is stimulated to form specific antibodies, a process which goes on for some time after inoculation, so that the acquired immunity from bacterins lasts longer than that which follows the use of serums. In the case of serums the antibodies are supplied to the patient; in the use of bacterial vaccines the

patient develops his own antibodies. In other words, if the disease is active, serums should be injected; if it is desired to obtain protection from future attacks, bacterins should be employed.

Inflammation.

ON *this pathological basis much of surgical disease rests.* Surgical inflammation is due in a great measure to the introduction into the tissues of germs which there multiply with great activity, forming as a result certain poisonous products called *toxines*. These *toxines* are deadly poisonous to the system, and when absorbed cause high fever, chills and sweats, loss of appetite and strength, and generally undermine the strength. It is as if so much mineral or vegetable poison had been introduced into the stomach. Their activity is astonishingly rapid when they are situated in tissues favorable to their development, like the peritoneum and other serous membranes, richly supplied with lymphatic vessels to convey the poison from one point to another.

There are several conditions favorable to the development of germs when introduced into the body, chief among which is *moisture*; hence to keep the wound dry and well drained is the constant aim of the surgeon. When bacteria are introduced into the system through a wound, they begin at once to put on their activity, and the production of *toxines* commences. Nature rushes, so to speak, to the field of the enemy, and a great fight at once occurs. She throws out a mass of lymph about the invaded portion of the flesh to surround the enemy and cut off his base of supplies. She forms out of her own blood *antitoxines*, so called. It soon becomes a question of which is the stronger form, — the *toxines* of the germs, or the *antitoxines* of the serum. This battle results in a thickened, congested, painfully swollen and reddened area, which, if nature conquers, softens and melts away, but which, if the enemy is victorious, breaks down and forms pus. The result depends largely on the location of the struggle, the strength of the patient, and the virulence of the germ. If it be in a part poorly supplied with lymphatic vessels and soft structures, nature has the advantage, because the enemy cannot find easy access to structures beyond the field of battle; but if the neighborhood of the invasion is in soft structures, the enemy quickly seizes on some short route to a neighboring lymphatic station and there deposits its poison and thus extends its field till nature is overwhelmed. The ability of nature to manufacture *antitoxines* quickly and mobilize her forces to the rescue on the one hand, and the virulence of the germ or its capability to develop its poison quickly, on the other, are always deciding elements in the preservation or destruction of the part attacked. Much is now being accomplished toward eradicating germ-diseases and germ-inflammation by the cultivation of this natural *antitoxine*. Its special victory is seen in the diphtheritic *antitoxine* with which that disease is now so successfully

fought. This antitoxine which nature throws out is cultivated in horses till such an amount is stored up that against it diphtheria no longer has any influence; this serum, so rich in antitoxine, is then introduced into the human subject as an antidote to the forming toxins of the diphtheria.

And so it is with lockjaw, rabies, and many other germ-diseases. This therapeutic agency is yet in its infancy, but much may be expected of it in the future.

But not all inflammation is necessarily of bacterial origin, at least so far as is yet proven.

Every part of the body which has vessels and nerves is liable to inflammation. Where there are no nerves, it cannot exist. Many diseases are caused by it. Mechanical injuries, such as cuts, bruises, and fractures, produce it. And many other disorders, not caused by or causing it in the beginning, become entangled with it in their progress. It is very important, therefore, to understand the nature and management of inflammation. It is not always to be looked upon as a disease; it is frequently a simple process of repair, whereby nature restores injured parts to health, in which there is no germ-life present.

The Signs of Inflammation are *redness, pain, heat, swelling and loss of function*, though in some cases these do not all appear.

Acute Inflammation. — When the redness, the pain, the heat, and the swelling are clearly marked, and the inflammation is so rapid that it either subsides in a few days, or quickly brings on *suppuration, or ulceration, or mortification*, it is said to be *acute*.

Chronic Inflammation. — When it is less painful, and slower in its progress, beginning very gradually, and lingering a long time, it is then *chronic*.

Common, or Simple, or Healthy Inflammation, is that which is not mixed up with any disease, but is established by nature for some salutary purpose, and is generally germ-free.

Unhealthy Inflammation is that which has been caused by some other disease, like the poison from germ life, and is under its control.

Specific Inflammation is that which seems to vary from all ordinary cases, being dependent on a particular state of the system, on an animal poison, or a principle of contagion or infection, and a power of propagation from one person to another, such as all germ-poisons.

Some of these produce such permanent effects, that those having them are not liable to a second attack.

Inflammation is Primary, or, as the doctors say, *idiopathic*, when it is the original disease.

Inflammation is Secondary, or Sympathetic, when it is the result of some other disorder, which goes before, and produces it.

It has been explained elsewhere that the different parts of the body are connected by little threads or nervous strings which run from one to the other. If one part of the body becomes injured or disordered, it uses these nervous threads as telegraphic wires, to tell other parts of its misfortune; and it sometimes happens that when the intelligence conveyed is of a sad and alarming character, the part receiving the news is so excited and distressed as to become *inflamed*. Nothing can be more proper than to call this *sympathetic* inflammation.

When the inflammation is violent, and is seated upon some important part, the sympathetic action is so great as to disturb the whole constitution; and this general disturbance is *sympathetic* or *symptomatic inflammatory fever*. On the other hand, it more frequently happens, especially in the light of modern surgical pathology, that the lymphatic system, which is in reality a delicate railroad system for the economy, leading toward the great citadel of life, the heart, carries over its tracks to the nearest station some of these germs or germ-poison from the primary wound or inflamed spot, thus spreading the contagion to whatever lymphatic station the vessel happens to run.

The Symptoms are quick and strong pulse, dryness and heat of skin, parched mouth, great thirst, scanty and high-colored urine, costiveness, disordered nervous system, loss of appetite, anxiety, restlessness, sleeplessness, headache, wandering and confusion of mind and sometimes delirium. This fever John Hunter called a universal sympathy of the body with the disturbed condition of a part of it.

It is only by inflammation that a wound is healed, or a broken bone repaired.

Upon the surface of a wound nature pours out a fluid called *plastic lymph*. This is composed of *fibrin*,—the material of which flesh is made,—united with a little of the watery part of the blood, chiefly albumen. The watery part disappears soon after it is poured out, and the fibrin hardens into a kind of membrane. Through this, nature sends small nerves, arteries, and veins, which she uses as *threads to sew up the wound*. Fibrin being the chief material with which nature constructs our bodies, she of course uses it to repair them when wounded, just as a carpenter, who constructs a floor with planks, uses planks to mend it when it is broken through.

Buffy Coat of the Blood.—The effects of inflammation extend to the blood. This fluid, when drawn from the veins of a person suffering from an inflammation active enough to disturb the constitution, forms a clot in the basin more slowly than usual, but the clot is harder; and a layer of fibrin is left upon the surface, of a *yellowish buff-color*, looking like size or glue, and called the *buffy coat*. The clot is also scooped out in the centre, and the blood is said to be *cupped*.

Coin Discs. — It is another peculiarity of inflamed blood, that if a drop of it be examined under a powerful microscope, its globules, or discs, which are very numerous, will be found standing on their edges, and leaning against each other, like a row of copper or silver coins. (Fig. 152.)

Inflammation may end in one of four different ways.

I. By Resolution. — Suppose a large splinter of wood be stuck into the hand of a healthy man. It causes redness, heat, swelling, and pain; and these combined are inflammation. The splinter is pulled out, and the hand well done up with a disinfectant dressing, and properly cared for. The redness fades, the heat declines, the swelling subsides, and the pain disappears; the inflammation is ended, and the hand is well. Coming to a fortunate end in this way, inflammation is said to be *resolved*, or terminated by *resolution*.

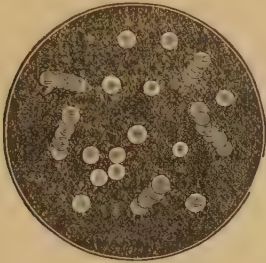


FIG. 152.

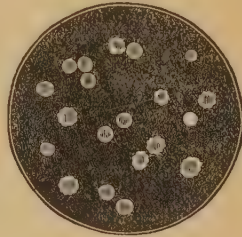


FIG. 153.

II. By Suppuration. — It does not always end so happily. The splinter may be broken off below the skin, and not pulled out; or, even if removed, germs may have been introduced from the splint or from the skin of the hand; these germinate rapidly and form pus, and instead of the inflammation abating, it will increase, and the centre of the injured part will begin to rise up to a point, and grow white on the top. This shows that there is *matter* formed underneath, which is lifting up the scarf-skin, and seeking to come through. Fig. 153 is a microscopic view of pus corpuscles.

The pain is now very throbbing and pulsating — keeping time with the beats of the heart. When the scarf-skin can hold out no longer, it breaks, and yellow, cream-like fluid runs out, which we call pus. The redness, pain, etc., now subside. This process we call *suppuration*.

At this time, if the wound have been a severe one, attended by sympathetic fever, and the discharge of pus be now large, there may be a change in the fever, marked by frequent shiverings and chilliness, followed by flushes of heat, which ends in sweating. We call this *hectic fever*.

III. By Ulceration, or the formation of open, running sores.

IV. By Mortification. — If the wounded part have been so much injured as gradually to destroy its vitality, it dies. The vivid red of the inflammation changes to a purplish, or livid, or black hue. The strained condition of the skin ceases, a bloody fluid lifts up the cuticle, the pain and feeling are all gone,—the part is dead and putrid, and gives out a peculiarly offensive smell. This process is called *mortification*.

The mortified and dead part is called a *slough*; and it is separated from the living parts by a peculiar vital process which has the name of *ulceration*.

Treatment of Inflammation. — Though inflammation sometimes ends kindly by resolution, and though it is often a salutary process, yet it is frequently very destructive, ending in suppuration, ulceration, and mortification, thickening, hardening, softening, and enlarging parts affected by it; and doing these things in textures of great delicacy, and of vital importance in the economy of life. It calls, therefore, for judicious, and, often, for very active treatment.

There are three principal things to be done, — to remove the cause, if it be still active, to take the blood away from the inflamed part, and to render the part aseptic, if possible.

If a bullet be lodged in the flesh, or a thorn, or a splint of wood, or a piece of glass, it is the exciting cause of the inflammation which follows, and little can be done to advantage till the offending substance is extracted. If inflammation be excited in the bladder by the irritating presence of urine which cannot be passed, this must be drawn off with the catheter before relief can be had. If the stomach be inflamed by improper food, or too much of it, the diet must cease to follow appetite, and take reason for its master. If ladies have excited inflammation in the bowels, or any of the internal organs, by a dragging weight of skirts, they must either put off the burden, or hang it upon the shoulders with straps.

The blood is removed from the inflamed part in two ways: —

Direct Method. — It is done directly by various methods which tend to take the blood out of the small vessels, which are so full and crowded as to produce pain. Cold water, ice, etc., applied to the part cause these little vessels to contract, and squeeze the blood out of themselves. These are very useful applications; and they are to be pursued as long as there is any hope of breaking up the inflammation, or causing it to end by resolution. But when this is no longer to be expected, and it is found that it will go on to suppuration, then apply warm fomentations and poultices. These will mollify and soften the parts, and cause the suppurating to go on more rapidly and with less pain.

Counter-Irritation. — The other method of removing the blood from the inflamed part is by what is called counter-irritation.

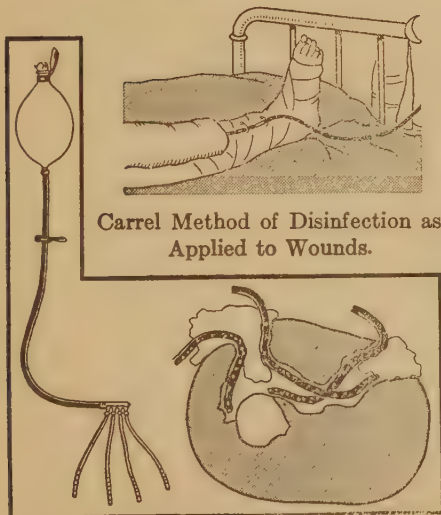
Costiveness is always produced by the symptomatic fever which often results from inflammation. This should be removed by saline purgatives, such as Rochelle, Epsom or Glauber's salts, salts of tartar, tartrate of potassa, and the tartrate of soda (9), (7), (12), (14), (18), (20), (25), (27), (41). Sometimes more active purgatives are required, and then the compound extract of colocynth, etc. (29), will be excellent, or two compound cathartic pills, at night, followed by (299) may be used.

As a drink, cream of tartar (298) will be found cooling and refreshing. In all inflammations, the diet must be light and unstimulating.

To allay the excessive fever and pain of inflammation, some of the coal-tar products may be used, like ammonol or phenacetine, in ten-grain doses, every two to four hours; but it must be remembered that inflammation is the result of poisons and not the cause of them, hence these remedies are but temporary and palliative, and must be used while the real cause is being fought by removal of the original source of the trouble.

The third method of treating inflammation is the most important, because generally it strikes home. Inasmuch as most inflammation which comes from outside causes is the result of the introduction of bacteria into the body, the most natural thing to do is to disinfect at once the injured or diseased part. Sulpho-naphthol or oil of milk is a good disinfectant, and is used in strength of one-half teaspoonful to a quart of water; this latter turns the water milk-color.

The Carrel Method of Sterilizing Wounds.



Carrel Method of Disinfection as Applied to Wounds.

Carrel Irrigator for Sterilizing Infected Wounds.

The pressure of war conditions in Europe has compelled the search for improved methods in the treatment of wounds, the most successful of which is the discovery made by Dr. Alexis Carrel of the Rockefeller Institute. This success is not due to the miraculous properties of any new drug. The antiseptic employed is Dakin's sodium hypochlorite 0.05 per cent. It is an ideal wound antiseptic of high bacterial activity and low irritating quality. It also has the great advantage of being able to dissolve pus, old blood clots, tissue debris, etc. All shell fragments, particles of clothing, dirt, etc., are removed. The wound is painted with tincture of

ing, dirt, etc., are removed. The wound is painted with tincture of

iodin, and the edges trimmed away. The placing of the tubes and their number varies with the nature of the wound, the guiding principle being to place the tubes so that the liquid will come in contact with every portion of the wound. Instillations of the fluid are made every two hours by releasing the adjustable clamp controlling the flow. The amount of solution employed varies with the nature and extent of the wound; for the average wound 10 c.c. are sufficient. This interrupted instillation is kept up until the wound is proved sterile. The tubes are then removed and a compress moistened with Dakin's solution is applied. The rate of instillation is from 5 to 20 drops a minute, according to conditions. The object is to moisten the wound surface and not flood the bed.

Suppuration and Abscess.

AN abscess is the collection of pus or matter in the substance of some part of the body. When the matter is poured out from some part, the process is said to be *suppuration*; when it collects in a tissue, it is an *abscess*. When the matter collecting in some organ comes towards the surface, and a place in the centre rises above the surrounding skin, and turns white, the abscess is said to *point*. Some abscesses point and break in a week; others of a more chronic character will linger on for months.

Fluctuation. — Before an abscess points, a *fluctuation* may generally be felt in the swelling, which is one of the surest signs that it contains pus. Sometimes this fluctuation may be felt even when the matter lies very deep in the flesh. And when it is so deep that it cannot be felt, if a sudden cessation of the symptomatic fever should occur, and *shiverings or rigors should come on*, attended by coldness in the affected part, we may reasonably suspect that pus is formed. It is not easy, at times, to say whether matter is really present; and great care should be used not to plunge in a lancet where none exists. Chills and fever due to pus formation are caused by the absorption into the system of the poisons of ptomaines, which are the result of germ-life, and their propagation.

Treatment. — When the abscess is completely formed, and there is no longer any doubt of the presence of matter, it should be opened at once. To let out the confined pus alleviates the pain and lessens the inflammation. If the matter lie close to a bone, the opening should be made without delay. The opening should be large enough to let the matter out freely. It is a rule to keep the incision open

till the cavity of the abscess is so far filled up that another collection of pus is not likely to occur.

If the matter do not readily get to the surface through the opening, it may burrow itself in the flesh, in a long narrow channel called a *sinus*. To relieve this, the opening must be extended in such a way as to give vent to the new collection.

An abscess is sometimes indisposed to heal at the bottom, and pus continues to be formed a long time, and is discharged through an opening smaller than the sack which contains it. This is a *fistula*, and the opening to it should be enlarged so as to let out the matter more freely. A little soft lint may then be gently pressed into the wound to prevent its healing before the cavity below. The cavity should be freely scraped out to remove all germ-life, and then thoroughly disinfected and kept clean and aseptic by aseptic gauze packings, and in this way nature is bound to heal the wound.

An abscess from acute inflammation requires to be poulticed for a time after it has been opened. When the swelling and inflammation are gone, the poultices are to be laid aside, and a bandage put on. When the inflammation is gone, let the diet be improved; and if the discharge of matter be large, give wine and tonics.

Mortification.

THE complete death of a part of the body, and its change into a black, stinking, cold, and insensible mass, with which the other parts of the system have discontinued all organic connection, is what we call mortification. That form of it which is most common is said to be *humid*, on account of the moisture of the dead parts. It is the result of nature having walled off by her antitoxin the scene of the battle, and while she has lost the original battle and the original field, has nevertheless succeeded in keeping out the enemy from the remainder of the system. The enemy feeds on the dead tissue, setting up a putrid, stinking cesspool of filth.

Gangrene.— Before the mortified part is completely dead, and, consequently, while its recovery is supposed to be possible, the condition of the part is called *gangrene*. Diabetes is shown by the presence of sugar in the urine, and kidney trouble is shown by the presence of albumen in the water; these are probably the two most common causes of gangrene in the extremities.

Sphacelus is the name given to it after its entire death.

Sloughing is the process of separating the dead matter, and the substance separated is a *slough*.

The causes of mortification are quite numerous. The most common are, stoppage of the circulation by inflammation, by mechanical causes which obstruct the passage of the blood, by chemical agents and poisons, and by local or general debility.

In a bad constitution, which bears disease poorly, mortification is *very* dangerous.

Treatment. — In treating mortification, three things are to be aimed at, — to stop its progress, to promote the separation of the dead from the living parts, and to heal the ulcer which is left after the separation.

To stop the progress of mortification, we must remove its cause. If it be inflammation, treat that according to the principles laid down, but do not weaken the constitution. As soon as the inflammation has subsided, particularly if the system be weakened, tonic bitters and a nourishing diet must be had. When there is fever, with great excitement of the nervous system, delirium, picking of the bed-clothes, etc., the patient should have anodynes (121) and antispasmodics (87), (91), (90), drafts upon the feet, and such other local remedies as the case may require. Here opium and stimulants are of paramount importance.

It is of little use to put anything upon the mortified part, except with a view of lessening the stench. For this purpose, lay upon the part lint soaked in a solution of chloride of lime or soda, or a solution of pyroligneous acid, or of creosote.

Very little can be done to hasten the separation of the dead part from the living; but while it is taking place, a common flax-seed poultice, mixed with a little powdered charcoal, may be kept on it.

The ulcer left after the separation is to be treated like other ulcers. A dressing of bovine and five per cent solution of carbolic acid, equal parts, will be found to hasten the granulation.

Pyæmia.

THIS frightful affection has been called the bane of surgery. It is caused by a peculiar poison, resulting from the fermentation and disintegration of the tissues of a wound, which is taken into the system either by the veins or absorbents, and is usually accompanied by the formation of collections of pus in the various tissues and organs of the body. It follows very trifling as well as severe injuries, and it is a frequent *sequela* of surgical operations, oftentimes of a very slight character. The only tenable theory which can explain the different phenomena of this disease is, that the pyæmic condition is caused by the absorption of septic material, sometimes in a fluid, sometimes in a gaseous state, which unfits the blood for the processes of healthy nutrition, induces capillary stagnation and its consequences, low forms of inflammation in different parts of the body, as in the joints and serous cavities, and may finally produce those sec-

ondary deposits of pus, in any or all parts or organs of the body, called metastatic abscesses.

When an internal organ is involved, the result is generally fatal. When suppuration attacks the integuments or the extremities, there is a fair chance of recovery.

Thence the disease has been divided into two classes : the internal or acute, the external or chronic pyæmia. When pyæmia involves the internal organs the course is usually rapid and fatal. When it attacks the external parts, it is slow in its course and may be recovered from.

Duration of the Disease. — Sometimes its course is so rapid that the patient may die in two or three days after the appearance of the symptoms. As a rule, however, bad cases terminate during the second week. Some go on for six or seven weeks. In cases which recover, the patient goes through a long illness and may be left permanently crippled by secondary affections of the joints. As a rule, the longer a patient lives the better the hopes of a successful ending.

Pyæmic symptoms generally make their appearance after the fourth day. The first symptom is a chill; this is repeated at irregular intervals, and is followed by profuse and exhausting sweats.

The hot stage which characterizes the malarial paroxysms of intermittent fever is usually absent or but slightly marked. During the course of the attack, the temperature of the body, which is naturally $98\frac{1}{2}^{\circ}$ Fahrenheit, may rise six or eight degrees, and in ordinary cases its fall is, as a rule, gradual. The greatest elevation of temperature corresponds with the period of rigor. During the sweating stage the temperature falls again. Should the fall be sudden, a general breakdown of the powers of the patient is indicated. The pulse rate varies, according to the violence of the attack, from ninety to one hundred and thirty. The respiration is usually rapid, from forty to fifty a minute, and in many cases a hay-like odor of the breath is present, which is considered pathognomonic of the disease. The countenance is flushed, the skin dusky, sallow, sometimes jaundiced and marked with sudamina.

The tongue is coated, and there is a complete loss of appetite, and often nausea and vomiting. The urine is frequently albuminous. When the brain is involved there will be sleeplessness, or delirium of a low, muttering kind; some unconsciousness, from which the patient can be aroused only to relapse.

Intense pain usually attends the secondary complications, though it is sometimes remarkable how slight the symptoms often are when severe local disease exists.

The wound becomes sanious, serous, and fetid; sometimes the secretions are arrested and the surface becomes dry and glazed; sometimes absolute sloughing occurs. Union, if progressing, will become disunion, and all reparative action ceases. As the disease progresses, the symptoms become profoundly typhoidal, and the patient may die comatose or from exhaustion.

The exciting causes of pyæmia are very obscure. It attacks the healthy as well as the feeble, those surrounded by perfect hygienic influences as well as those who are exposed to deleterious influences. It is found not only in hospitals but in private practice; but it is more prevalent in unhealthy places, in the overcrowded wards, and in those spots where ventilation and drainage is bad. It lurks among the poorly housed and poorly fed and clad, and wherever those influences exist which are depressing to the vital powers.

The general treatment in these cases is of paramount importance. It is the duty of the surgeon to see that the patient's room is well ventilated, and that it is frequently purified by cleansing and disinfectants.

The wound is to be kept clean and well drained.

The dressings should be changed as often as four times a day, and saturated with disinfectant lotions.

When sloughing exists the charcoal poultice should be applied, and every measure pursued which will insure the outmost cleanliness of the patient and his surroundings.

The curative treatment is to be conducted on the same principles which guide the surgeon in the management of all cases of a typhoidal character.

The bowels if constipated are to be opened by a gentle laxative, and the different secretory organs restored to a healthy action as far as possible.

The vital energies of the patient are to be maintained or stimulated, and everything that tends to lower them must be warded off.

Quinine is the most valuable remedy we have for the treatment of pyæmia. Some surgeons give it in large doses and speak highly of its effects. It is valuable in doses of four or five grains every three or four hours. It may be combined with iron advantageously in some cases. The best combination is with the citrate of iron. Four grains of each are to be given four or five times a day.

Stimulants are also of great importance to maintain the powers of life. In some cases it is necessary to employ them freely to keep up the waning strength.

The diet should be as nutritious as the patient's assimilative powers will bear. Milk and the animal broths are the best.

When the stomach rejects nourishment it must be given by the rectum, enema of beef-tea and milk with brandy being administered every four hours.

When the nervous system is disturbed by pain and want of rest and sleep, some of the forms of opiates or anodynes are to be given, small doses frequently repeated being better than large.

Should diarrhœa exist it is to be kept under control. It should not be checked suddenly, as it appears to have an eliminative tendency in cases of blood-poison.

Carbonate of ammonia in ten-grain doses five or six times a day is a valuable remedy when other tonics cannot be tolerated.

When secondary abscesses form, they should be opened and kept cleansed by some disinfectant fluid, such as carbolic acid or the solution of the chlorinate of soda, in their proper strength.

Ulcerations and Ulcers.

WHEN the small particles composing the body have been used a while, they wear out, and become useless. Over the whole body are distributed a multitude of small vessels, called absorbents, whose business it is to pick up these worn and loosened particles, and carry them away.

There is another class of small vessels, having just the opposite duty, — namely, to bring new particles of matter, and put in the places of those taken away. These are arteries. They are the natural artisans, who construct our bodies. The absorbents are the demolishers who pull them down. Under these two forces, our existence is, for a time, a drawn game between life and death. The absorbents, like myriads of hungry insects, eat us up, — the constructing arteries, like faithful builders, reconstruct us. The work of the absorbents, is called *absorption*; that of the constructing arteries *nutrition*.

When nutrition partially ceases, and absorption continues unabated, we grow thin, or lose flesh. This happens in consumption. If nutrition should stop altogether, absorption going on as usual, our bodies would be quickly destroyed. We should be wholly devoured by these little absorbent vessels. This would be *ulceration* applied to the whole body. But it does not appear in so *general* a form. It confines itself to particular parts.

When nutrition entirely ceases in any portion of the body, the absorbents devour all the skin, flesh, and vessels of the part, — leaving an open cavity. The process of taking away the flesh, etc., is *ulceration*, — the cavity left is an *ulcer* or *sore*.

Natural Surgery. — Ulceration sometimes acts the part of a natural surgeon. When a part dies from mortification, it is necessary to have it removed; so nature sets up, directly around it, an acute inflammation, in which all nutrition stops, and absorption goes on rapidly. In this way, a complete dike is in a short time made around the dead mass, and it is as handsomely amputated, or cut off, as any surgeon could do it.

When the ulceration is going on, and the blood-vessels are being cut off by it, the blood coagulates or curdles in them for a short distance back from the breach, which prevents bleeding. This is as good as tying the arteries.

Some textures ulcerate more easily than others, — the skin and mucous membranes most easily of all.

Ulcers are divided into *healthy*, *unhealthy*, and *specific*.

A **Healthy ulcer** is a simple sore, not showing any bad symptoms, but rather a kindly disposition to heal. It is generally small in size, of a florid-red color, and has upon its surface little elevations, pointed like cones, called *granulations*, which are not so apt as in the case of unhealthy ulcers, to rise above the level of the surrounding skin.

Unhealthy Ulcers comprise those called *irritable, indolent, phagedenic*, etc.

Indolent Ulcers are numerous. The edges of the skin around them are generally thick, prominent, and rounded. The granulations are pale, smooth, large, and flabby, with a peculiar gloss upon them. These ulcers form most often on the leg; and the nearer they are to the ankle, the harder they are to cure.

Phagedenic Ulcers are those which look as though they literally eat away the parts. Their surface has a livid appearance. The matter formed is small in quantity, and is frequently tinged with blood.

Specific Ulcers embrace *scrofulous, cancerous, venereal, scorbutic*, and others. They are called specific because they are produced by particular diseases and states of the system.

Treatment.—The first thing to be done is to remove the exciting cause. A venereal, or a scrofulous, or a scorbutic ulcer, cannot be cured, unless we first lessen the force of the disease in the general system. If the continuance of a sore depends on bad digestion, we cannot expect to cure it till we put the stomach right.

Healthy ulcers need no treatment, except some simple dressing, such as oxide of zinc ointment. It is well, in some cases, to touch the granulations near the surface with lunar caustic.

Ulcers upon the legs and ankles do not heal well if the patient walks about much, or even allows the legs to hang down a great deal. The patient must be put to bed and the leg bandaged, especially if the ulcers are the result of the breaking down of varicose veins, which are so common a cause of leg-ulcers.

Indolent ulcers are to be touched by lunar caustic, or by diluted nitric acid. The diluted ointment of the nitrate of mercury is also often used with benefit. So is the compound tincture of benzoin, the basilicon ointment, etc. Or, apply a bread-and-milk poultice to the ulcer, and keep the patient twenty-four hours in bed. Then apply the lunar caustic to the whole sore, and to the skin around it. Afterwards cover the ulcer with sticking plaster, and a bandage.

The following is the best plan. Lay upon the sore a number of pieces of lint, soaked in the nitric-acid lotion (314), and cover them with a bread-and-milk poultice. Change these applications twice a day, and continue them till the discharge looks healthy, and the granulations begin to appear.

If there is inflammation about the sore, give some of the prepara-

tions of salts to purge the bowels, and confine the patient to bed. When the parts begin to look healthy, lay some pieces of lint upon the sore, wet with nitric-acid lotion (214), or zinc lotion (215); and then apply strips of adhesive plaster, one and one-half inches wide, two-thirds round the limb, and extending an inch below the ulcer and an inch above it,—at the same time drawing the edges of the sore together with a gentle force, and retaining them there with the plaster. Put a compress of soft linen over the plaster, and apply a bandage over the whole, making it tighter below and a little looser above, and extending to the knee. (Fig. 154.)

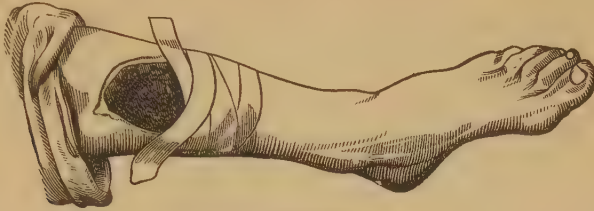


FIG. 154.

Surgeons frequently snip out little pieces of healthy skin from some adjacent part and graft onto the ulcer, thus shortening the process of healing. A dressing of bovine and water in equal parts hastens the growth of the flesh part. Whenever the flesh is even with the skin it should be kept at this level by some mild caustic, as stated above. Then comes the time for transplanting skin. The varicosities of the veins must be cured, or at least improved before the ulcers will remain healed. Avoid the use of pork or lard.

Boils.—*Ferunculus*.

UNDERNEATH the skin is a layer of tissue composed chiefly of cells. From this tissue there are small elevations, in the shape of cones, which rise up into the substance of the true skin. Like those papillæ of the skin which become inflamed and produce *corns*, these elevations are subject to an inflammation, which causes *boils*.

At first, a tender knot or hardness is felt just under the skin, which soon begins to look red. A painful tumor now begins to show itself, of a dusky red or purple color, which acquires the size of a pea, a hazel-nut or a walnut. Some time between the fourth and eighth day it becomes pointed and white at the top, when the scarf-skin gives way, and lets out a little pus mixed with blood, and exposes to view a mass of dead matter, called a *core*, which is too large for the opening, and is not ready to come away, if it were not. This core is a mass of *mortified* or *dead* flesh; and nature is cutting a space around it, that it may be thrown off. In two or three more days, it comes away, leaving a cup-like cavity, which gradually fills up, and the boil is over.

Some constitutions yield boils in successive crops. When this happens they are a terrible affliction. There are not many Jobs who can bear them with patience.

Treatment.—A boil will generally run its course. A five-grain blue-pill, taken at bed-time, when the boil is first showing itself, is about the only thing I know that will blast it. And yet, my unwillingness to encourage a general use of mercurials makes me hesitate to recommend it. One pill, not to be repeated, can do no harm, however, and may safely be taken.

Boils may sometimes be stopped by touching them with lunar caustic. Water-dressing, if used early, and persevered in, will sometimes prevent their growing larger than a pea. After the boil has opened, apply poultices for a day or two, then some simple, stimulating ointment, as basilicon salve, or Turner's cerate, or nitric acid lotion (314). If boils continue to come out in successive crops, give alterative medicines, or sulphurous mineral waters, or liquor potassæ, or bicarbonate of soda. General tonic treatment, with iron, quinine, etc., is usually required (65), (75).

A pill containing $\frac{1}{2}$ grain of sulphide of calcium three times a day and continuing for several months, while not able to cure the boil which is forming, will in a great measure prevent the appearance of others.

Carbuncle.—*Anthrax.*

THIS is like a boil, only much larger and more painful. Instead of one of the little cellular elevations being inflamed, as in the case of the boil, the carbuncle begins with the inflammation of several. Its surface is more flat than that of a boil; its inflammation more violent; and the constitutional symptoms excited more severe. It has the breadth, sometimes, of the top of a quart bowl. Like the boil, it appears most often upon the neck, the shoulders, the back, the buttocks, the thighs, etc. It goes through the same process as a boil, and ends in the same way, only discharging a vastly larger core.

Carbuncles most often appear in persons above middle age, and indicate an impaired and broken constitution. They occasion great suffering, and sometimes prove fatal. Upon the head or neck, they are more dangerous than in other situations. They are now considered to be of bacterial origin.

Treatment.—Apply, constantly, during the formation of the carbuncle, either fomentations and poultices, or cold-water dressing. I prefer the latter. To stop both the local and the constitutional disorder, make two incisions in the form of a cross, cutting entirely through the dead mass. Then apply a fermenting poultice, or one of oatmeal, for two or three days, after which use the basilicon salve, or apply daily a weak solution of lunar caustic, or the nitric-acid lotion (314). During recovery, tonics are useful, such as quinine, tincture

of peruvian bark. Immediately on formation of carbuncle take Succus Alterans (*Lilly*), and continue three months. It will purify the blood and prevent another forming.

Malignant Pustule.

THIS is one of the five diseases which man may take from animals. The other four are the *cow-pox*, *hydrophobia*, *glanders*, and *malignant carbuncle*. This last is what the French call *charbon*, — pronounced *sharbo*. My own mother and elder brother came near losing their lives by it, — having taken it by handling the flesh and tallow of a dead cow.

Malignant pustule begins with a water pimple, not bigger than a millet seed. Underneath it is a hard point, surrounded with redness, like a flea-bite. This hardness is soon attacked by mortification, which spreads on all sides, and kills everything as it goes. Next, in fatal cases, come great restlessness, faintings, sunken countenance, dry skin, dry brown tongue, despondency, delirium, and death. It is supposed generally not to arise from constitutional causes, but to be produced by a specific poison or bacterium applied to the skin, or by eating the flesh of cattle which die of gangrenous diseases. The disorder is probably the same as the malignant carbuncle.

Treatment. — Deep incisions, and the application of the most powerful caustics, as the caustic potash, etc., and tincture of peruvian bark, quinine, aromatic sulphuric acid, wine, ether and opium. Probably the best treatment is to *surround* the pustule with a thick layer of ointment; then to fasten some lint to the end of a stick, wet it with nitric acid, and press it upon the pustule. Now apply cloths, wet with cold water, and when the slough comes off, dress with simple ointment, or touch occasionally with weak solution of nitrate of silver (211). When once opened it should be thoroughly irrigated with disinfectants like corrosive sublimate, in strength of 1 part to 2000 solution.

Chemical Injuries.

THESE are of two kinds, produced by causes of an exactly opposite nature. The first are

Burns and Scalds.

A *burn* is the effect of concentrated heat acting upon living tissues. The effects are inflammation, and sometimes complete disorganization and destruction of the parts.

A *scald* is an injury produced by applying hot water or other fluid, to the skin or mucous membrane. The natural temperature of the human body is ninety-eight degrees; that of boiling water, two hundred and twelve degrees. Bringing the skin in contact with a fluid

heated so far above it, produces redness and pain ; and when nothing is done instantly to ward off the injury, the scarf-skin is raised from the true skin in the form of a blister, filled with water.

The degree of danger from a burn or scald depends upon the *extent* of the injured surface, and also upon the *depth* of the injury. An extensive scald or burn may prove fatal in a few hours,—the patient never rallying from the first prostration. These injuries are most dangerous when upon the head, neck, chest and belly. Old persons, and those who are feeble and have shattered constitutions, will sink under burns and scalds from which robust persons will suffer but little.

Treatment.—For slight burns and scalds, make cold applications. Put the injured part in very cold water, or lay upon it pieces of linen, or lint, wet with vinegar and water, or rose-water and sugar of lead (238), or diluted solution of acetate of ammonia. When these are not to be quickly had, lay on scraped raw potatoes, which is one of the best remedies to give immediate relief. The object is to reduce the inflammation, and to prevent blistering. They must, therefore be put on very soon. If the scald be extensive, and on the *body*,—producing shivering, faintness, paleness and coldness of the skin, and a small pulse,—cold applications are not proper. In such case we may use warm fomentations, or, in the case of a child, the warm bath. A liniment of spirits of turpentine, linseed oil, etc. (194), makes an excellent application. Also (371).

Raw cotton, spread out thin, and laid upon a burn, is a good dressing, and one which is much used. So is flour sprinkled upon the injured surface with a dredger. For loosening the flour when it is to be taken off, poultices are useful.

Keep the air from the wound as much as possible. With this view, do not remove the dressing often, and when a cold lotion is used, merely pour it upon the rags, letting them remain undisturbed. Stimulate and narcotize the patient if exhausted by the shock of the burn. Nothing is more generally used than carron oil, which is composed of equal parts of linseed oil and lime-water. It soothes, heals and promotes granulation.

Effects of Cold.—Frost-Bite.

COLD is a relative term. The same temperature may be called hot or cold, according as it is compared with a hotter or colder temperature. If we warm one hand by a fire, while we lay the other upon ice, and then plunge them both into cold water, the water will feel cold to the one which has been by the fire, and warm to the one taken from the ice.

The warmth of the body being ninety-eight degrees, any temperature below this may be said, in a certain sense, to be cold. Yet a temperature much lower than this, namely, from sixty to seventy, is

the most agreeable and invigorating, because it takes away the heat just about as fast as it is produced in a healthy body.

The first effect of cold applied to the body is to weaken the circulation in the small blood vessels of the skin. When applied with some intensity, the heart and arteries in general are weakened; the blood is delayed in the vessels near the surface, and not being changed to a red color in the lungs as fast as it should be, the fingers, ears, etc., become blue or livid; and, if the cold be continued sufficiently long, the circulation stops in these parts; heat ceases to be evolved, and mortification or death is the consequence. Parts killed in this way are said to be *frost-bitten*.

A free circulation of red blood is essential to the continuance of sensibility. Hence, when the circulation is seriously impeded by cold, the body becomes numb,—it loses its feeling; the muscles act feebly; a languor and torpor follows; drowsiness comes on, followed by sleep, from which there is no waking. Drowsiness, during exposure to extreme cold, indicates great danger.

Treatment.—It is a great principle in restoring frost-bitten parts, and persons benumbed with cold, to communicate heat in the most gradual manner. It has been said that the degree of external heat should be in proportion to the quantity of life. When life is weakened and nearly destroyed by frost, therefore, the warmth must be small, and rise no faster than life returns.

To restore a frozen limb or part, rub it with snow, or place it in cold water for some time. When feeling begins to return, still keep it in cold water and let heat be added in a very gradual manner, by pouring in, now and then, a very small quantity of warm water.

If a person be reduced by cold to insensibility, and *apparently frozen to death*, take his clothes off, and cover him all over with snow, except the mouth and nostrils. If snow is not to be had, put him in water as cold as ice, and let him lie for some minutes. Then rub him with cloths wet with cold water. When the body is thus thawed by degrees, and the muscles begin to relax, dry the body, and placing it in a cold bed, rub with the warm hands, only under the clothes. Continue this for hours. If signs of life appear, give a small injection of camphor and water, and put a drop of spirits of camphor on the tongue. After a time, rub with spirit and water, and finally with spirit, and give tea, or coffee, or brandy and water.

Chilblains.

THESE are caused by exposure to cold, and affect the fingers, toes, and particularly the heels, with a painful inflammatory swelling, of a red, purple, or bluish color. The skin may be red in patches, and slightly swelled, with itching, tingling, pain, and lameness; or there may be blisters, around which the skin is blue or purple; or, worse yet, there may be ulceration and sloughing.

Treatment. — Stimulating liniments are the remedies usually employed for this complaint. One of the best consists of six parts of soap liniment, and one part of tincture of Spanish flies; and another excellent one is prescription 307. If there is ulceration, use Turner's cerate, or the resin ointment.

Mechanical Injuries.

WOUNDS are divided into several kinds.

Incised Wounds are very common. Being made with sharp instruments, they are *cuts*, and have no laceration or tearing about them.

Stabs, or Punctured Wounds, form another class. They are made with pointed weapons, as bayonets, lances, swords, and daggers. They are more dangerous than the former, because they penetrate to a greater depth, — injuring blood-vessels, nerves, bowels, and other organs.

Contused and Lacerated Wounds form still another class. They embrace gun-shot wounds, and all those produced by blunt instruments. They *tear*, and *bruise*, and *mash* the flesh.

Poisoned Wounds form yet another class. They are such as are united with the introduction of some venomous poison into the incised, or punctured, or contused part. Stings and bites of venomous insects and snakes are of this class, — also the wounds made by poisoned arrows.

Simple Wounds are such as are inflicted on a healthy subject with a clean, sharp instrument.

Complicated Wounds are those inflicted when the state of the whole system, or of the wounded part, is such as to make it necessary for the surgeon to deviate from the treatment needed for a simple wound, — as, for example, when there is bleeding, or nervous symptoms, or great pain, or locked-jaw, or much contusion, or erysipelas.

Lacerated wounds are more dangerous than incised ones, because the parts are stretched and otherwise injured, besides being separated.

A very small wound upon the brain, the spinal marrow, the bowels, or the heart, will often prove fatal, because the functions of these parts are intimately connected with life.

Wounds of young persons heal much more rapidly and kindly than those of old persons.

Septic Wounds

WHENEVER a surface has been cut, lacerated, or in any way injured, so that the surface can absorb germ-life from the instrument inflicting the wound, from the dressings used to cover it up, or from

the dirt of the skin itself, we are very apt to get in a few days what used to be known as *sympathetic fever*, but which is no more or less than the septic fever, or the systemic manifestation of germ absorption. Fever, loss of appetite, headache, swelling and tenderness of the wound, with perhaps pus formation, are the natural outcome of such absorption. Hence it will readily be seen from what has been previously said about *sepsis*, that the first indication in all cuts is to disinfect the area injured with some one of the germicidal solutions. None is cheaper than corrosive sublimate in the strength of one part to two thousand. This, in many cases, is all that need be done. If the cut is to be sewn up, the wound is first cleaned with corrosive sublimate or oil of milk solution (a half-teaspoonful to one quart of water), and then sewn with needle and thread that have been boiled five minutes. The dressings or bandage should be disinfected with steam before being applied. Druggists nowadays keep in stock aseptic gauze meant for precisely this class of cases, lacerated wounds, etc.

Incised Wounds.

WHEN the flesh is divided with a cutting instrument, the cut edges separate, and the wound has a gaping appearance. This drawing apart happens in consequence of the elasticity of the skin. It often happens that vessels of considerable size are cut, so that bleeding is the principal thing to receive attention.

Treatment of Hemorrhage.—Bleeding is stopped by the *tourniquet*, by the *ligature*, by *compression*, by the application of *cold water* and *ice*, and by *astringents* and *styptics*.

The Tourniquet. — This instrument consists of a band and buckle, a pad and two brass frames, the upper of which is furnished with two small rollers, and the lower with four, over all of which the band plays. When the handle is turned to the right or left, the band is tightened or relaxed to just the extent required. (Fig. 155.) The band is buckled round the limb in such a manner that the pad is placed exactly over the artery. When an artery is cut, it is known by the blood being *very red*, and *spirting out in jets*; and in this case, the instrument must be placed upon the limb *above* the wound, or between it and the heart.



Fig. 155.

The Ligature.—When an artery is divided, the surgeon lays hold of the end of it with his forceps, and ties a thread tight around it, or twists the end of the artery. This is called a *ligature*. By it, the bleeding is instantly stopped, and long before the thread becomes loose, the opposite sides of the vessel have grown together, and all danger of a renewal of the bleeding is over. In all these procedures the careful surgeon uses only disinfected instruments and ligatures.

Application of Water and Ice.—This is done by saturating with cold water several folds of linen rags, or lint pads, and applying them to the wound, remoistening, and reapplying them as fast as they become hot, till the pain and inflammation subside.

Compression.—When the blood does not come from any large vessel, but from several small ones, compression is sufficient. It consists in placing the opposite sides of the wound together, if possible, and then laying compresses over, and applying a bandage with moderate tightness.

Astringents and Styptics.—These are spirits, tinctures of myrrh, Peruvian bark, diluted mineral acids, solutions of tannin, alum, sulphate of copper, decoctions of white-oak bark, etc. These have the power to stop bleeding from small vessels. Monsel's salt is said to have more power than all the above. It is a preparation of iron and nitric acid, and has been used with great success in stopping violent bleeding. It is not a caustic or an irritant; but it acts very powerfully upon albumen and blood,—producing with the latter a large clot, *absolutely insoluble*, which continues to enlarge for several hours after the application, and becomes quite hard and firm, so that no blood can get through; but it leaves the wound filled with clots which afterward decompose and often give rise to blood-poisoning. The compress wrung out of some antiseptic solution is always the best method when practical.

Beside these means, the application of the lunar caustic, potash, and the hot iron, are used, particularly the first, quite often.

Union by the First Intention.

WHEN the bleeding is stopped, all foreign substances removed, and the wound properly cleansed, the next thing is to bring the opposite sides of the cut evenly together, and to keep them steadily in this position till they have healed. If this method succeeds, the healing takes place without the formation of any pus. This is called *healing by the first intention*, or *adhesion*. The cut surfaces *grow together*. For keeping the surfaces together, straps of adhesive plaster are used, putting them at right angles across the cut, and leaving spaces between them.

Sutures.—Incised wounds are sometimes *sewed together* by what is called the *interrupted suture*. After the bleeding is stopped, a

a curved needle is threaded, and, the lips of the wound being brought together, is introduced through the right lip, and then, being directed across the wound, is pushed through the left lip, from within outward. It is now cut off, and tied in a bow. These stitches should be at least an inch from each other. These needles and sutures are, of course, to be boiled or otherwise rendered aseptic before using, as well as the hands of the one doing the sewing. Needles and thread come all ready put up in glass tubes, having been first sterilized, and kept in alcohol or in a vacuum for any length of time perfectly germ-free.

The first plasters and dressings should remain on the parts at least three or four days, unless very great pain, bleeding, or some other bad symptom, should call for their removal.

Useful Rules for Examining and Dressing Wounds.

NEVER give the patient more pain from the mode of handling and dressing the wound than is necessary for his present good or future safety. Never distress him by probing, squeezing, etc., to find things that will be of no use when learned.

Make all examinations as soon after the accident as possible; for before inflammation and swelling take place, the probe or finger inflicts much less pain.

In changing the dressing of a wound, let all the fresh ones be ready before the removing of the old. The sponge, warm water, adhesive plaster, lint, ointment, lotions, bandages, etc., should all be at hand, and not have to be looked after when the wound is exposed.

Put the patient in the most easy position, that he may not be needlessly fatigued during the dressing.

If the bandage, plaster, and other dressings, have become hard, and glued together, and to the skin, by blood or matter, soften them with warm boiled water, which is to be pressed out of a sponge,—a basin being held below the part to catch the water as it falls from the dressing.

The strips of adhesive plaster are to be removed by pulling gently at one end, and then the other,—each to be drawn *towards* the wound, so as not to pull its lips apart.

In large wounds, take off one, or at most, two strips of plaster at a time. Cleanse, wipe dry, and again support this part of the wound with new strips of plaster, before any more are taken off. This will prevent the wound being torn open by the weight of its parts.

If the wound be large and deep, its sides should be supported by an assistant while changing the dressings.

If there are several wounds, dress but one at a time, that there may be no needless exposure to the air.

Pay the utmost attention to cleanliness, asepsis and dryness.

The frequency of the dressing must depend on the amount and quality of the discharge, the situation of the injury, the climate and season of the year, the effect produced by the dressing, and by the feelings of the patient.

Remember that the one great desideratum is to keep away all germs from the wound and its vicinity.

Antiseptic Dressings.

ANTISEPTICS have lately attracted a great deal of notice in the treatment of inflammation, especially resulting from wounds.

The article most used at the present time for this purpose is carbolic acid. Lister is its chief advocate, and under his authority it has established a position which deserves attention.

It is based upon the germ-theory of disease, which is founded upon the observations of Pasteur. The theory supposes that animal decomposition is due, not to the chemical action of oxygen, or any other gas, but to the presence of organic germs floating in the atmosphere. Carbolic acid is used on account of its known destructive effects upon low forms of organic life.

These low forms of vegetable organisms, which float in the air in great abundance as constituents of the dust, are called by naturalists bacteria, of which there are many varieties. Whenever they find entrance into the body, there putrefaction is produced.

These vegetable parasites are capable of a wonderful power of multiplying their species, — a single germ producing in a few hours many thousands. Once admitted into the body, they find their way everywhere, — into the muscles, into the blood, into the different organs of the body, — and they spread destructive fermentation and putrefaction wherever they go.

In accidental wounds, it is first necessary to kill any septic organisms which may have been introduced from the air or from contact with foreign bodies. We do this by thoroughly bathing the surfaces with a solution of carbolic acid, of the strength of one part of the acid to twenty of water.

When the wounds are made by the surgeon, the germs are destroyed by means of a spray imbued with the acid. This spray is produced by an atomizer, of which there are many kinds, and is thrown continually on to the surface of the wound, until the completion of the operation, including the ligaturing of the vessels and the final stitching together of its edges.

Lister also recommends the use of carbolized catgut for ligatures, being of an animal substance and finally absorbed.

When the operation is fully completed, the antiseptic dressings are applied. Besides these antiseptic precautions, in cases of large and deep wounds a drainage tube is introduced to allow for the escape of the serum.

The antiseptic dressings consist of — first, the protector; second, the carbolized gauze; third, the mackintosh; and fourth, another layer of the gauze, and a bandage of the same to keep the whole in place. For the purpose of protecting the cicatrizing parts from the irritating effects of the gauze, a layer of oil-silk coated on both sides with copal varnish, and afterwards brushed over with dextrine, to enable it to become uniformly moistened when dipped into a watery solution of the acid, is applied directly over the wound, the ends of the drainage tube protruding about an inch from each extremity of the incision. The wound is then covered with a layer of antiseptic gauze dipped into a solution of one to forty of the acid. There are then superimposed six other layers of dry gauze; then the mackintosh or a piece of rubber cloth; then an eighth layer of gauze large enough to cover in all the remainder, and finally a bandage of the same.

When the dressings are renewed, it is to be done under the spray, great care being taken not to admit any non-carbolized air.

The dressings are not to be changed until the discharge has begun to soak through and appear below the edge of the rubber cloth.

Use dry dressing wherever practicable. Where much pus is being discharged this is out of the question, but where no pus is issuing, or in wounds that are entirely closed in, a dry sterile dressing which is aseptic, or germ free, rather than antiseptic or germ kill, is the best method.

The antiseptic gauze is made by impregnating cotton cloth of open texture with a mixture of carbolic acid one part, resin five parts, paraffine seven parts. The resin acts as a vehicle for the acid, while the paraffine is added to prevent inconvenient adhesiveness.

The Way in which Wounds Unite.

WHEN the two surfaces of a wound are brought together, they become impervious to the blood, but not to coagulable lymph, or fibrin. This, — the material of which all flesh is made, — flows out upon the two surfaces, and becomes a bond of union between them.

Into this layer of fibrin, the small blood-vessels, — arteries and veins, — which have been cut asunder, push themselves with open mouths, and, meeting in the center, they inosculate, or grow together, and the blood resumes its circulation through them.

By this method, incised wounds of moderate size are often healed in forty-eight hours. This method of healing by the first intention is always to be brought about, if possible.

Punctured Wounds.

THESE are produced by swords, daggers, etc.

Great swelling and inflammation, large abscesses, erysipelas, the wounding of large arteries, and the consequent extravasation of blood,

symptomatic fever, and lock-jaw, are the frequent results of punctured wounds. They are, therefore, more dangerous and hard to cure than cuts.

Treatment.—For the first twenty-four hours, use superficial dressings of lint, wet with some disinfecting liquid, and a loose bandage. If, after this, pain and swelling increase, hot fomentations may be applied, placing a small linen rag or gauze, that has first been soaked in the disinfectant, over the wound. When the pain and inflammation are great, saline purgatives (7), (18), (25), (27), and opiates are often called for.

Contused and Lacerated Wounds.

THESE are produced by cudgels, stones, bullets, or whatever else of a blunt nature tears asunder the muscular fibres, leaving jagged and uneven surfaces. They are rarely healed without suppuration, and are frequently followed by violent inflammation. They suppurate and slough, but they do not bleed much,—not even, sometimes, when large arteries are torn asunder. Whole limbs are occasionally torn away without hemorrhage. In warm climates, lock-jaw is a frequent consequence of them.

Treatment.—Draw the edges of the wound loosely together, and retain them with a few strips of adhesive plaster. Sometimes a suture, here and there, will be proper. If a great deal of inflammation ensues, take away the adhesive plaster and the stitches, and apply a poultice, or water-dressing; and if there be much fever, restlessness, or delirium, saline purgatives (18), (25), and opium (118), will be needed; but especially will it be necessary to again disinfect the wound, and by every means possible render the field aseptic.

The wound having thrown off its sloughs, suppurated, become clean, and formed granulations, the poultices are to be taken off, and simple dressings substituted. These should be adapted to the conditions of the sore, according to the directions for treating ulcers.

When the wound is so severe that extensive mortification will be sure to follow, the limb must be immediately taken off, to save the life of the patient.

Granulation and Scarification.

SUPPURATING wounds heal in the same way as ulcers. The chasm is filled up by the appearance of little soft elevations of new substance, which originate at all points, and meet at the centre, drawing the sides nearer together, and raising the bottom towards the surface. This is called *granulation*, because these elevations *look like grains*; and the result is a new tissue, of a peculiar character, which constitutes the *cicatrix*, or scar.

Reproduction of Lost Parts.

AMONG some of the lower animals, whole limbs which have been destroyed are easily reproduced. It is not so with man; though certain parts, when only partially destroyed, are sometimes regenerated. Thus, portions of skin, of considerable extent, are often reproduced; and so are the whole of some long bones, when destroyed by necrosis. The same is true, to some extent, of ligaments. But portions of brain, and spinal marrow, and muscle, and mucous membrane, when once removed, are never regenerated.

Gunshot Wounds.

At a time when fire-arms are so much carried about the person, and so often used for purposes of duelling and murder, it is proper that every person should know something of the modes of treating gunshot wounds.

Treatment.—It is often proper to make a gunshot wound larger at the orifice. When this is done, it is generally on the side where the bullet has passed out, if it has gone entirely through. A bullet is always to be removed, if it can be felt.

The dressings are at first to be superficial, light, unirritating and aseptic. The common antiseptic dressing, covered with a piece of oiled silk, is one of the best. Where suppuration occurs, because of the introduction of germs into the wound, poultices may be called for, but the douching and cleansing of the wound with hot oil of milk solution is often demanded and always grateful.

Poisoned Wounds.

To the bites and stings of various creatures man is exposed in most climates, and in all seasons of the year. These may be divided into three classes.

Bites of Mosquitoes and Spiders, and Stings of Bees and Wasps.—For these, the best applications are a solution of common salt, or water of ammonia, or sugar of lead (239), or laudanum, or tincture of iodine. If none of these are at hand, at the moment, cover the part with wet earth. Tincture of arnica (240) is a good application. (See article on Bites, etc.)

Bites of Venomous Snakes.—Either instantly cut out a piece from the bitten part, or apply caustic to prevent the absorption of the poison, or suction with the mouth will sometimes answer the same purpose. After doing one of these things, give arsenite of potash solution, twenty drops, in a little water, every two hours. Also purgative injections, stopping the arsenic when purging is well established; or drink freely of whiskey.

For the bite of the rattlesnake, a remedy is alcoholic drink, taken in large quantities, and immediately. Gin and whiskey are believed to be the best. Fill the system full. When the poison has begun to take effect, enormous quantities will be borne, before intoxication can be induced. Keep the whole person saturated until the symptoms decline.

The best treatment is the prescription of the saturated solution of permanganate of potassium applied directly to the wound and the dose of 1 to 2 grains diluted given by hypodermic injection about the wound.

Also a ligature applied in the form of a rope or twisted handkerchief between the bite and the heart, and twisted tight to stop the circulation, will prevent the entrance of the poison into the blood.

Fractures.

THE existence of a fracture is to be known by the symptoms. These are pain, swelling, deformity from the limb bending to one side, sometimes shortening of the limb, or loss of power to use it, and a crepitus or grating sound or sensation from the rubbing of the ends of the broken bone together. There are several kinds of fractures. They are

The Transverse Fracture, which is directly across the bone.

The Oblique Fracture, which runs from side to side, in an oblique direction.

The Longitudinal Fracture, which runs lengthwise of the bone.

A Simple Fracture is one in which the bone is broken simply, without any wound of the flesh with it.

A Compound Fracture consists of a simple fracture, and of an external wound in addition, caused by pushing the end of the broken bone through the flesh.

A Complicated Fracture is one in which, besides the breaking of the bone, there is the dislocation of a joint, the wounding of an artery, the extensive tearing of the soft parts, or the wounding of the bowels or some other internal organ.

A Comminuted Fracture is one in which the bone is broken into several pieces.

Treatment of Fractures. — When a bone is broken, the first thing to be done is to get the injured person to his home, or to the nearest house. To do this in a rough or careless way might add much to his sufferings.

If it be an arm which is broken, let it be placed in a broad sling, extending from the elbow to the fingers. In this condition the patient, if in tolerable health, and the distance is not great, will find it easier to walk home, than to bear the jolting of a carriage.

If the leg or the thigh be broken, then a hurdle of some sort (Fig. 156), must be obtained as

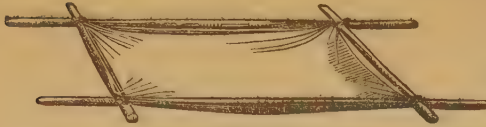


FIG. 156.

soon as possible, and, being covered with straw, or blankets, or garments, the patient should be gently lifted upon it by just persons

enough to raise him easily from the ground. This should now be carried by four persons, two at each end, moving with great gentleness, and keeping exact step with each other. If these persons take hold of the ends of two poles, laid under the hurdle, they will find they can carry it much more easily. If no hurdle be at hand, let four poles, two long ones, and two short ones, be laid across each other at right angles, and fasten together with nails or strings. Then lay upon these an old door, or some loose boards; and the injured person may be easily carried upon this temporary structure. A blanket fastened upon four poles, in the manner of a cot-bed, will answer a good purpose.

Having placed the patient upon the hand-carriage, bring the sound limb and the broken one snug together, and tie them to each other with two or three pocket handkerchiefs; this will support the broken limb, and prevent its being shaken about and injured by motion. In doing this, the limb should be laid as near as possible in the natural position, so that the bones may not get out of place, and their ends get pushed through the flesh.

The Reduction, or Setting of the Fracture, is the first thing to be done. By this is meant the bringing of the ends of the broken bone together, and adjusting them to each other in their natural position. This is done by what surgeons call *extension*, *counter-extension* and *coaptation*.

Extension means taking hold of the limb *below* the fracture and pulling *from* the body.

Counter-Extension is pulling *above* the fracture *towards* the body. These opposite pullings are done at the same time to overcome the force of the muscles, which contract, and draw the ends of the bone by each other and shorten the limb.

Sometimes no extension or counter-extension is necessary, the ends of the broken bone not being pulled out of their place. When the pulling is necessary, it should be gentle and steady.

Modern surgery has developed two simple mechanical means of making extension and counter-extension for the purpose of overcoming muscular spasm which rarely fail. One is by the use of elastic rubber bands, and the other by the attachment to the limb of a cord running over a pulley at the foot of the bed and sustaining a suitable weight. The method of employing these will be given in detail in connection with special fractures.

Coaptation means *adjusting* the ends of the bone to each other.

The next thing is to provide for keeping the ends of the broken bone steadily in contact, so that nature may have a fair chance to unite them.

To secure this object, mechanical contrivances are used, which are simple, and may always be had without difficulty.

They consist of *linen bandages*, about the breadth of four fingers, and from four to ten yards long; and *pads*, made of old woollen cloth or blankets lightly quilted together, or pillow-cases filled with tow, or chaff, or cut straw, or even leaves; and of *splints*, made of clapboards, or thick shingles, four fingers wide, and in length corresponding with that of the broken limb; or wheat straw laid side by side, and quilted into a piece of cloth to prevent them moving about. A very useful splint may be made from the fresh bark of trees.

The pads are to be placed *under* the splints, to prevent injuries to the skin; and the bandages to be bound over the whole.

A great point is to have the splints accurately adapted in each case, and the ability to affect this is an important element of success in this branch of surgery. Wood may be generally cut into suitable shape, but it is perhaps easier to use moulded splints of leather, felt, gutta-percha, or shellac cloth. The starched or plaster bandage or gummed paper may be effectively used; and with a proper pair of shears, sheets of tin or zinc may be cut into splints, which will answer admirably. Woven iron wire splints are highly recommended.

For some hours after a limb is broken, the parts continue to swell, and if bound up *immediately* with the pads, splints, etc., much needless pain will be occasioned. It is best, therefore, not to put these on under two or three days, but merely to lay the limb in a natural position, and perhaps lightly bind one splint to it. Broken ribs and collar-bones are exceptions, and should be bound up immediately.

A broken arm lies easiest half bent, upon a pillow; the thigh or leg, upon the outside, with the knee bent.

When the apparatus is once adjusted, the less it is meddled with the better.

In fractures of the shoulder or arm, a sling is a contrivance of great importance. This, if well made and adjusted, keeps the broken bone in its place, and at the same time allows the patient to take some exercise by walking about.

Besides the above contrivances, there is the *double inclined plane*

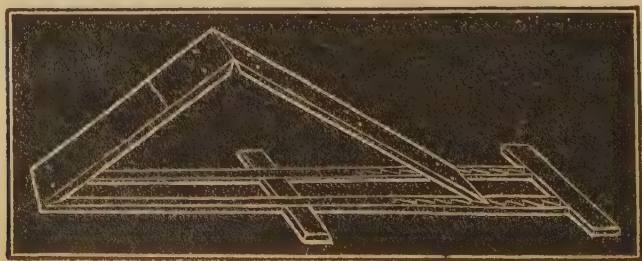


FIG. 157.

(Fig. 157) for giving the leg the advantage of a bent position. There are also *fracture-boxes* (Fig. 158) and *fracture-cradles*,—the latter to keep the bed-clothes lifted away from the painful limb. *Fracture-beds* are now brought to great perfection, and one should, if possible, be procured when the patient is likely to be confined a long time with a compound fracture. The fracture-box represented by Fig. 158, may be made from thin boards, by any carpenter. It has a hinge at the knee to enable it to fulfil the double purpose of a double-inclined plane and a fracture-box.

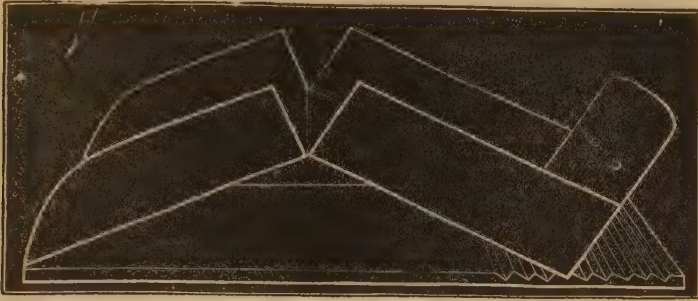


FIG. 158.

The Way in which Broken Bones Unite.

THE union of broken bones is much slower than that of severed flesh. The ends of the bone being kept steadily together, they soon become surrounded by a swelling of the soft parts, which change to a sort of osseous substance, making a kind of bony hoop, to act as a splint or support, — nature not being willing to trust the surgeon to keep the fragments exactly in their place. This is called a *provisional callus*, because it only has a temporary use.

This *First Stage* lasts about ten days. At the end of this time, a spongy substance appears between the ends of the bone. This substance is not bone, but in the swelling around the fracture specks of bone begin to be deposited; the fibrin here poured out becoming first cartilage, and then receiving into itself phosphate of lime, it becomes bone. A similar work is going on within, in the part called the medullary membrane.

This *Second Stage* lasts from the tenth to the twenty-fifth day.

Then begins the *Third Stage*, which goes to the end of the sixth or eighth week. During this period the external swelling, and the internal medullary membrane, become completely ossified and firm, though the ends of the bone are *not yet* grown together.

The *Fourth Stage* goes to the end of the fifth or sixth month. During this time, the *external swelling*, or *provisional callus*, becomes covered with a *periosteum*, and the ends of the bones themselves are fastened together by a bony union.

The *Fifth Stage* extends from the fifth or sixth to the twelfth month. During this time, the ends of the bone become grown together so strongly that the bony ring, or provisional callus, is no longer wanted, and it becomes absorbed, and disappears; in other words, having no further use for it, Nature takes off her splint. The place where the fracture was is now as strong as any other part.

Union in Compound Fractures.

THE union of compound fractures takes place in a different way from that of a simple fracture, just described. The bones remain dis-united several weeks, and there is no provisional callus formed; but after some weeks the ends of the bone *soften* and *granulate*, and these granulations are gradually changed into bone.

In nothing have the benefits of antiseptis been shown so vividly as in the treatment of compound fractures. Twenty years ago a large percentage of all compound fractures either suppurated or caused the death of the patient; but now suppuration and high mortality are not seen. The wound is treated exactly like any other wound, on aseptic principles, the bones being held in place as usual. Union thus results without suppuration, and a cure is completed in one-half the time, with over fifty per cent less mortality than was the case previous to the introduction of aseptic and antiseptic surgery.

The first thing in event of a compound fracture is to render the parts aseptic as soon and as completely as possible. This may be done by a thorough scrubbing with tincture green soap and water for five or ten minutes, and then, after washing off the soap with alcohol, to thoroughly scrub the skin adjoining the wound with some one of the disinfectants mentioned under the heading of Sepsis and Asepsis; as, for instance, corrosive sublimate, one part to two thousand parts of water. The wound is to be dressed precisely as any wound, and is to be so arranged that access may be had to it for future dressings. When skin and flesh are much torn they may be sewn together with a needle and thread or silk which has been boiled five minutes. The stitches are to be removed from the fourth to seventh day. The bones are to be approximated just as in simple fractures, and splints applied.

Formerly the mortality of compound fractures was very high, owing to the invasion of the tissues by germ-life, but since the introduction of antiseptic measures in surgery, the death rate has fallen so markedly as to be a matter of great pride to surgeons and the world at large.

In cases where the wound does not allow of good coaptation, and much mangling of the tissues has occurred, it may be well not to suture the parts, but to dress them with some antiseptic gauze drainage, and do them up like an open wound.

Time Required for Uniting Different Bones.

FRACTURES of the arms unite sooner than those of the legs.

The ribs and collar-bone unite with tolerable firmness in about a month; those of the arm in six weeks; of the thigh and leg in eight weeks. I only mean the firmness derived from the provisional callus.

A broken bone will unite much sooner in a healthy person than in an unhealthy one; much sooner in a young than in an old person.

As a general rule, the apparatus should be kept on thirty days in the case of children; forty days in that of adults; and much longer in that of aged persons.

False Joint.

THE union of a broken bone is sometimes prevented by a frequent moving of the limb. The ends of the bone, having failed to grow together, will sometimes become rounded and smoothed, uniting only by a kind of ligament, and acquire the habit of sliding upon each other, and thus form what is called a *false* or *artificial joint*,—the limb being permanently capable of bending to some extent, at the place of the fracture.

Fractures of the Skull.

THESE are always dangerous in their nature, and the aid to be derived from surgery is much less than in other fractures. If a fracture of the skull produce deep sleep and snoring, and the patient does not show any symptoms of pain when pinched, etc., we are to infer that a piece of bone is pressed down upon or into the brain.

In this case, if the position of the blow be known, a cut is to be made through the skin, two or three inches long, down to the bone. If arteries bleed, they must be taken hold of with a pair of forceps, and tied with a silk thread, the ends of which are to be cut off. The bone being well exposed by one or two incisions, the piece which is pressed down upon the brain is to be raised with a chisel, or some similar instrument, to a level with the other bones. The surface must then be cleansed antiseptically, the hair around shaved off, the skin brought together, and the cut edges reunited by sticking plaster.

When the inflammation appears, twenty-four hours after, it is to be kept down by doses of from five to ten drops of tincture of *veratrum viride*, given every one or two hours.

Fractures of the Bones of the Nose.

INJURIES of this kind may generally be rectified by passing a strong probe up the nostril, and pressing out the bones to their natural place, at the same time using the fingers on the outside to prevent their being pressed out too far. Inflammation must be kept down by cloths wet in cold water and laid on, and by light diet.

Fracture of the Lower Jaw.

THIS usually takes place near the chin. It may occur also near

the angles of the jaw. It may be simple or compound, and is known by the pain, the swelling, the inability to move the jaw, the indentation felt by the finger, the irregularity of the teeth, and the grating sensation felt while moving the jaw with the hand placed on the back fragment.

Treatment.— Let one or both thumbs be introduced into the mouth. With these, keep the back part of the jaw stationary, and pull forward the fore part with the fingers on the outside. In this way the fracture can soon be put right. This done, shut the mouth firmly, and place a thick compress of lint over the broken part; over this put a piece of pasteboard, wetted so as to bend easily to the parts, and over this a strong bandage of muslin, two and a half inches wide, with a small bag to fit and hold the chin; all which is represented in Fig. 159.

For a fortnight the patient must feed on gruel, broth, arrow-root and milk, that the jaw may not be displaced by chewing.



FIG. 159.

Fracture of the Collar-Bone, or Clavicle.

THIS accident generally occurs about the middle of the bone, and is generally caused by falls on the arm and shoulder.



FIG. 160.



FIG. 161.

Symptoms.— Pain and tenderness at the place of the injury, and inability to lift the arm; a small bunch or prominence at the point of the fracture; the distance from the point of the shoulder to the breast-bone shorter than on the other side; and the dropping downwards, forwards, and inwards of the shoulder. To make the case sure, *compare* the two bones, and see whether they agree.

Treatment.—Place the knee between the shoulder-blades, and grasping the round ends of the shoulders with the two hands, draw them gently back till the ends of the bone come to their proper place; or place the elbow of the patient close to the body, and a little forward, and then push it upward.

To retain the shoulders in this upward and backward position for some weeks, pass a flannel bandage, four inches wide, around the front of one shoulder, under the arm-pit, across the back, over the opposite shoulder, under the other arm-pit, and again across the back, in the form of the figure ∞ . To prevent the bandage from cutting the skin, put pads under the arms. (Figs. 160 and 161.)

Fracture of the Shoulder-Blade.

WHEN this accident happens, the body of the bone is generally broken across by some great direct violence. In a few instances, the end next to the collar-bone is broken.

Symptoms.—Great pain in moving the shoulder, and the *grating* sensation which may be felt by placing one hand on the upper end of the bone, and moving the lower portion with the other.

Treatment.—A bandage must be passed round the chest, and a few turns be made around the upper arm, so as to fasten it to the side, and prevent all motion. Purging, low diet, and the tincture of veratrum viride will be required to keep down inflammation.

Fracture of the Acromion, or the end of the scapula which unites with the collar-bone, may be known by the flattening of the shoulder,—the broken part being drawn down by the action of the deltoid muscle.

Treatment.—It must be supported by the same bandages as are used for a fracture of the collar-bone; and the elbow must be well raised, so that the head of the upper-arm bone may be lifted against the upper portion of the scapula, and act as a prop to keep it in place. No pad should be put in the arm-pit, for this would push the broken part too much outward. Gentle motion of the arm may be begun about the sixth week.

Fracture of the Upper-Arm Bone.

THE bone of the upper-arm is most frequently broken near the centre, though it may be fractured near the ends. It may be known by taking hold of the arm above and below the suspected fracture, and attempting to move the ends of the upper and lower fragments upon each other. If there be a fracture, the grating of the broken ends against each other will either be heard or felt. The arm will also be bent and helpless; and if the ends of the bone be slipped by each other, it will be shortened.

Treatment.— Let a powerful man take hold of the arm and pull gently and gradually, but with considerable force, till the arm is brought to its natural length, another man taking hold of the body of the patient, and pulling in an opposite direction. In the mean time, the surgeon is to adjust the ends of the bone to each other, and apply a bandage, but not very tightly, from the elbow to the shoulder, and over this, four splints, with pads under them; one in front, reach-



FIG. 162.

ing from the shoulder to the bend of the elbow, with a few turns of the bandage over it; another behind, reaching from the shoulder to the point of the elbow, with a few turns of the bandage around it also; another on the inside, extending from the arm-pit to the inner projection of the bone at the elbow, also secured by a few turns of the bandage; and the fourth one on the outside, reaching from the shoulder to the outside knob at the elbow. The whole is now to be secured either by a bandage or tape. (Fig. 162.) The arm is to be confined to the side, and the hand and fore-arm placed in a sling. In from seven to ten days, the dressing should be taken off to see if all is right.

Fracture of the Elbow.

THIS may be known by the patient being able to bend the arm, but not straighten it, and by the grating which may be heard or felt when the arm is moved back and forth by the operator, and also by the severe pain felt in the fractured part.

Treatment.— First apply leeches and evaporating lotions to reduce the inflammation. When this is effected, straighten the limb, and apply a bandage snugly from the fingers to the elbow. The broken end of the bone must now be brought to its place, and the bandage continued over it, and for a few inches above it. Secure it here, and bring it back, — carrying it above and below the elbow for several times; and then extend it up to the shoulder. A splint must now be applied to the inner side of the arm to prevent its being bent, extending from the hand nearly to the shoulder, and another, of similar shape, to the outside. The joint should be kept quiet for four or five weeks, during which time the splints may be taken off three or four times, to see if there is any chafing of the skin, or any disturbance of the bones.

Fractures between the Elbow and Wrist.

THE part of the arm between the elbow and wrist, called the *fore-arm*, has two bones, — one extending from the elbow on the inside to the wrist at the root of the little finger, called the *ulna*, and the

other on the side next the thumb, a shorter and a smaller bone, and called the *radius*.

When both these bones are broken at the same time, the fracture may be easily discovered; when only one, the sound bone keeps the other in place, and the injury is not so easily made out.

Treatment. — Relax the muscles by bending the elbow, and then, by extension and counter-extension, put the ends of the bones in proper place; then place two splints, thickly padded in the centre, one upon the front of the hand and forearm, and the other upon the back of the hand and forearm, — the palm of the hand being turned, not towards the chest, but downwards. They are to be covered with a bandage from the fingers to the elbow. The whole arm and hand should be placed in a sling, and remain in this position four or five weeks.

Fractures of the Wrist, Hands, and Fingers.

THE setting of fractured bones in these parts is to be done by extension and counter-extension, as in the case of other bones.

If the wrist be broken, a splint should be applied in front and one behind, and a bandage bound tightly from the hand half way to the elbow.

In fracture of the bones of the hand, a pad or compress must be put upon the palm of the hand, and a splint placed over this, with a bandage extending from the wrist to near the ends of the fingers.

If one finger only be broken, apply narrow pasteboard splints on four sides, and cover them with a narrow bandage; and then bandage the whole hand.

In all these fractures, place the hand in a sling. About three weeks will be required for the bones to unite properly, and several weeks more for the parts to acquire their natural usefulness.

Fracture of the Ribs.

THIS accident occurs either by blows, or by being crushed between two opposing forces. One, two, or more ribs may be broken at a time, according to circumstances.

Symptoms. — A fixed, piercing pain, made worse by breathing, coughing, or any other motion, and also a grating sensation during the taking of a long breath, the hand being laid upon the injured part at the time.

Treatment. — The ribs are to be held steadily in their place by pressure. To effect this, request the patient to draw in a long breath, and hold it. While the ribs are swelled out in this way, and the broken ends are thus brought to their proper place, pass a woollen bandage, five or six inches wide, several times tightly around the chest, from the arm-pits to the pit of the stomach. This will confine

the muscles of the chest, and the breathing will have to be done with the muscles of the belly, and the ribs will thus be kept still, and have a chance to grow together.

If the pleura be wounded, and inflammation follow from this or other cause, the patient must be confined in bed, kept on a low diet, and his pulse be kept down by tincture of *veratrum viride*. The bowels should be emptied by recipes 18, or 10, or 27, or 41, both to subdue inflammation, and to give the diaphragm a chance to drop down freely.

Fracture of the Breast-Bone.

Symptoms.— The injured part is frequently either sunk down or raised up; there is difficult breathing, cough, spitting of blood, pain, inability to lie on the back, and a grating noise caused by breathing.

Treatment.— The same as that for broken ribs. Should the broken part be pressed down upon the lung, so as to cause serious difficulty of breathing, an incision may be made, and the broken piece raised up with a chisel, or stiff case-knife, or some similar instrument.

Fracture of the Haunch-Bones, or Pelvis.

THESE fractures are dangerous,— being often connected with some other injury, as tearing of the bladder, lower bowel, or great veins or arteries. Fortunately, however, they are only caused by some great violence, and do not often occur.

Treatment.— Place the patient in the easiest possible position, and keep him entirely at rest. Generally a catheter should be kept in the bladder, that the water may pass off easily; and the whole hips should be bound round tightly with a flannel or calico bandage, and made as firm and fixed as possible, to keep the broken bones together. The most perfect rest must be ordered for six weeks or two months.

If the extreme lower end of the sacrum, the *os coccygis* (Figs. 8—3) be broken, the separated portion must be put in its place by introducing the finger into the rectum; and the bowels must be kept loose by gentle physic, that the broken bone may not be pushed from its place by the pressure against it of hard stools.

Fracture of the Thigh-Bone.

THE points where this bone are broken are at its upper portion or neck, and near its middle. The break at this latter place may be straight across, or oblique,— partially lengthwise. When oblique, the point of the bone may stick into one of the large muscles, and be made fast by it.

Symptoms.— The fracture in the middle of the bone, if it be transverse, may be known by some swelling or irregularity discovered by

running the hand along the thigh, and grasping it here and there ; and if it be oblique, the ends of the bone will be drawn by each other, and the limb will be shortened.

Treatment. — Place the patient on his back, and let two strong men use extension, — one taking hold near the hip, and the other grasping the limb at the knee and pulling steadily and strongly till the limb is of the proper length, and the ends of the bone are in their place. The man who takes hold of the upper end of the limb may hold it more firmly and with less fatigue by passing a folded sheet around the groin.

The extending force being still continued, the operator is now to apply the splints, which are to be four in number, — one in front, reaching from the knee-pan to the groin ; one behind ; one on the inside, from the upper part of the thigh to the inside of the knee ; and a fourth one, about four inches wide, reaching from the arm-pit to a distance of two or three inches beyond the sole of the foot. Cotton must be placed under these splints to prevent their injuring the skin, and they must be of a width to nearly, but not quite, touch each other. These being properly adjusted, and the extension still continued if the fracture is oblique, the bandage is now to be firmly applied from the foot to the upper part of the thigh, and then passed a few times around the body. This fracture is sometimes treated without splints, as represented in (Fig. 163).



FIG. 163.



FIG. 164.

Six or seven weeks will be required for the bones to grow together,

during which time the patient will need to lie upon his back. But the dressing may now and then be taken off and put on again.

Sometimes only a single long splint is used; sometimes no splint; in still other cases, four splints, — the outside one being short, and the limb resting on a double inclined plane.

Fracture at the Neck of the Bone. — When the bone is broken at the neck, close to the hip-joint, the injury is known by the knee and foot turning *outward*, and by the limb being an inch or two shorter than the other (Fig. 164). This is an accident to which old persons are particularly liable. When the bone is broken here, it seldom grows together again. The union which is formed is generally by a ligament.

Treatment. — This requires a very long splint, reaching from the armpit to beyond the sole of the foot, and bound firmly with a bandage, as in fracture in the middle of the thigh. The limb should be kept extended, and the injured one must be bound to the other by a bandage, keeping both legs straight and immovable. A broad leather strap, bound firmly round the hips and thighs will be serviceable.

Two or three months will be required for the injury to become repaired, so that the limb may be used. The patient must get up cautiously, and be careful not to use the limb much so long as pain is produced.

Fracture of the Knee-Pan.

THE knee-pan (patella) may be broken up and down, or across; — the latter fracture is the more common. It is a troublesome fracture, and is very apt to leave a *stiff knee*.

Symptoms. — When the bone is broken across, the patient cannot stand upon the limb; the leg may be flexed or crooked, but cannot be straightened, the upper part of the knee-pan is drawn up away from the lower portion, leaving a wide gap, into which the fingers may be laid, — at the top and bottom of which the rough edges of the movable bones may be felt.

Treatment. — First, reduce the inflammation by applying anti-phlogistine. Then straighten the limb, and put a well-padded splint behind, to keep the knee motionless; place the patient's body in a half-sitting posture, and raise the foot considerably above a level. Put a bandage over the splint, beginning half way up the thigh, and extending down to the knee-pan, and being made very tight just above the broken bone, so that it cannot easily slip under it. The broken bones must now be brought together, and the bandage be passed below and again above the knee several times in the form of a figure 8, to keep the bones from parting.

The bandage, generally, may not be removed for a fortnight. After this period, if everything has gone on well, the limb may be carefully bent a little every day, to avoid a *stiff knee*.

Fracture of the Bones of the Leg.

THE *leg* is that part of the limb between the knee and ankle. It has two bones; the smaller on the outside, called the *fibula*; the larger on the inner and front side, called the *tibia*, or shin-bone.

One or both of these may be broken at the same time. If both are broken, it is impossible to walk upon the limb; there is a change in its shape; it may be bent; and the grating of the broken ends of the bones may be felt or heard.

Treatment. — First, adjust the bones by means of extension and counter-extension, as in other fractures. Then apply two splints, one on the outside from the knee to the sole of the foot; the other upon the inside. Over these a bandage is to be firmly applied, reaching from the toes to the knee. The leg may rest upon the side or the back, as the comfort of the patient may require. Upon the side is generally the easiest position, with the knee a little bent (Fig. 165).

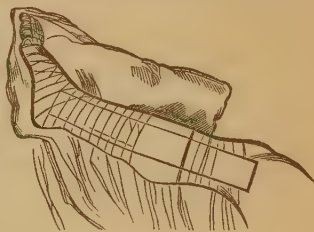


FIG. 165.

The dressing may be removed in six or seven days, to see that the bones are in their proper place. Five or six weeks will be required for recovery; and at the end of this time, the dressing may be laid aside. But the patient must use his leg very gradually.

In the treatment of fractures of the shafts of the bones of the lower extremities, three indications should be fulfilled: First, coaptation and fixation of the fragments; second, moderate extension; third, gentle compression and support. Provided these requirements are carried out, it matters little what apparatus may be employed; but that which can be applied with the least disturbance of the fractured bone, and is most comfortable to the feeling of the patient, should be preferred.

The best mode of extension and counter-extension now in use is by raising the foot of the bedstead about eight inches, by a block of wood placed under each fore-leg. This makes an inclined plane, and the body consequently tends to incline towards the head of the bed; this is the counter-extension.

Then extension is made as follows: A strong piece of adhesive plaster, about two and one half inches wide and about three feet long, is applied to the sides of the leg, extending from a little below the knee, leaving a loop under the foot four or five inches long. This is secured firmly in place by a bandage to the whole length of the leg. A piece of cord is fastened to the loop and passed over a pulley, which is fixed to the foot-board of the bed. To the other end of this cord is attached a weight. This need not exceed ten or twelve pounds.

In this way we get our counter-extension and extension: the body is drawing one way and the weight is pulling the other all the time.

This is a simple and comfortable way of treating fractures of the shafts of the bones of the lower extremities which require extension. It may be applied to the different fractures of the neck of the thigh bone, to fractures of the shaft, and also to fractures in the shafts of the bones of the leg.

It is the best and most effectual way of preventing undue shortening that we have in use, and what is of as great importance to the patient, a most comfortable way of keeping the painful limb in the proper shape.

The object of this weight is to cause extension and counteract the pull of the muscles, and paralysis is caused by the weight used in proportion to the size of the patient, his age and muscular development. After two or three weeks use of the weight recommended, namely twelve pounds or so, it is desirable to diminish the weight by degrees until such time as the weight can be dispensed with entirely, which is usually after four or five weeks, and the splints themselves may be allowed to remain three or four weeks longer. In the impacted fracture, which variety occurs when the main part of the broken bone is forced into the lesser fragment, no unusual motion is present. This form of fracture is very common in the aged and it may result in some permanent displacement and lameness, but the best treatment is not to break up the impaction which would be done in a younger patient, as in the aged a fracture after being changed from an impacted to a simple one might not unite readily. The treatment then for this class of cases, especially after sixty or seventy years of age, would be to let the leg lie quietly in bed with heavy oblong bags filled with sand placed on each side of the limb to prevent motion until the bones are set and healed in the new location.

Fractures of the Bones of the Foot.

THESE are to be treated in the same manner with fractures of the hand. They are often attended with much other mischief, as laceration of the flesh, ligaments, etc. Hence, cutting off the foot, or a part of it, is often necessary. Pasteboard splints are frequently used in these fractures. If matter forms, it must be let out by opening the parts.

A useful and simple expedient that may be used in all fractures and, in fact, any troubles of the lower extremities where dressings are needed, is the building of a cradle to prevent the clothes coming in contact with the injured parts.

This may be made by taking three laths or thin strips of wood about an inch wide, one-eighth to one-fourth inches thick and from two to four feet long, nailing three or four half barrel hoops at right angles to this piece and equal distance from one another, so that when placed on the bed and encircling the leg, the clothes will be kept away and pressure averted. This arrangement is desirable during the heat of the summer months.

Compound Fractures.

IN many simple fractures, as, for instance, a fracture in the shaft of the lower leg and in certain selected cases of breaks at the ankle joint, the use of plaster of Paris casts enables the patient to go around somewhat with the use of crutches, when if using the splints it would not be advisable to allow him to leave the bed. This bandage may be made by taking thin meshed cheese-cloth, about four inches wide and three or four yards in length, spreading it out on a board and winding the bandage tight after rubbing plaster of Paris on the surface of the cloth. These are then ready for application after being entirely covered by water for two or three minutes or until the bubbles of air cease to rise. After the fracture has been in splints long enough to be sure that all swelling has ceased subsiding or surely will not increase any more, the temporary splints which have been used to hold the parts in position may be removed and a thick dressing of sheet wadding may be wrapped around the limb. Over two or three thicknesses of the wadding the prepared plaster bandage is then rolled. These may be smoothed over and the limb held in proper position until the plaster is set, which usually takes fifteen to twenty minutes. Absolute inability to move the joints and broken bone can now be assured if the plaster has been put on in the proper manner, though care must be taken in the application of this as in any bandage not to stop the circulation, and a pulse must be sought for beyond the bandage, that is, on the side of the bandage farthest away from the heart. These bandages may be left on from two to three weeks if the leg does not become loose inside of that. Then the bandage should be cut down lengthwise from top to bottom with a sharp knife, care being taken not to go through suddenly and injure the leg. The use of cider vinegar will make the plaster cut more easily.

When, in connection with a broken bone, there is a wound of the flesh, which leads to, and communicates with the space between the broken ends of the bone, the whole injury is called a *compound fracture*. The wound in the flesh may be caused by the same force which breaks the bone, as a bullet from a gun, or a cart-wheel, or some machinery in which the limb is entangled. Quite often the flesh wound is caused by one of the ends of the bone being forced through the flesh and skin.

But, however caused, a compound fracture is of a much more serious nature than a simple one; and it is particularly dangerous when a joint is involved. It is more serious above the knee and elbow than below, and more to be dreaded in the lower limbs than in the upper.

Treatment.—An attempt should always be made to preserve the limb; it should not be cut off, unless the compound fracture is of the worst kind. But if there be no hope of saving the limb, the

amputation should be performed at once, while the constitution is tranquil, and before it has been shocked and injured by suppuration, abscesses, and sepsis, which sometimes follow such grave injuries.

But, suppose it be determined not to cut the limb off,—as it generally should be,—the first thing is, after the bone is set, to close the wound against all entrance of air, and to cause it to heal by the first intention, that is, without suppuration. To do this, one method is to cover the wound with lint dipped in blood; but the more usual mode is, to bring the sides of the wound together, and secure them very carefully by strips of adhesive plaster, in the same way as in common cuts. The bandage should be kept wet with cold water, by squeezing a sponge over it, or by sprinkling cold water upon it as fast as it becomes dry.

It will be necessary, in this case, to keep the bed-clothes away from the limb while it is thus wet, which may be done by cutting a barrel hoop in two, and nailing it to two pieces of lath. There should be air circulating under the sheet, that the heat of the inflammation may not keep the limb in a steam bath.

Should the wound heal by the first intention, the danger will soon be over, and the treatment may be the same as for simple fracture. But this, unfortunately, does not always occur.

It occasionally happens, that after three or four days, the patient grows restless, has very short and disturbed sleep, is hot and thirsty, has headache and shivering fits, is more ill towards evening, wanders in his mind, or becomes delirious, and perhaps dies in ten days or a fortnight from the sepsis or blood-poisoning that has taken place. If the symptoms are a little less severe, the wound will at first discharge a small quantity of dirty, bloody matter, which, if everything goes well, will, by degrees, change to healthy matter, without smell, of a straw-color, and about as thick as cream.

The fever, and other bad symptoms, will now subside; the sleep and appetite come back, and a new process begins, that of healing by *granulation*, or the formation of new flesh to fill up the gap made by the wound.

For old persons, or those whose health has been broken, this stage is full of danger, and is apt to result in death, if the lower limb be the injured part.

If the constitution proves unable to bear up against this stage of the injury, alternate heat and sweating set in, the face is flushed with a pink color, the pulse becomes weak and quick, the body wastes, the appetite disappears, the tongue becomes dry and brown, restlessness, wandering, and delirium follow in quick succession, and all are speedily terminated by death. With the setting in of these symptoms, the wound stops discharging, or throws out only a thin, watery and stinking matter. Quite often the skin and other parts mortify, and if there be strength enough to throw off the dead parts, the broken ends of the bone stick out, looking dead and white.

When the constitutional symptoms begin, open and thoroughly disinfect the wound and provide for free drainage; a poultice may also be used if much pain be present. The poultice must be continued till the wound is filled with new flesh nearly to the surface.

It must be said in justice to modern surgery, that, if antiseptics are used at the first dressing of the wound, we expect union by first intention, and the avoidance of pus formation with all the dangers this entails. The wound is to be treated just like other fresh wounds, aseptically; the limb may then be done up like a simple fracture, but the dressings should be so arranged as to allow of subsequent inspection. (See article on Asepsis, etc., p. 572.)

Dislocations. — Luxations.

THE surfaces where two bones meet and glide upon each other for the purposes of a joint, are called *articular surfaces*, and the union is said to be an *articulation*. These surfaces are covered by a smooth cartilage, to render their play upon each other easy.

The joints are held together by cartilaginous straps and ligaments, which serve as pulleys; by the aid of these, the joints turn back and forth, as a door opens and shuts upon its hinges.

When by some external violence, or the weakening of these ligaments, these surfaces are suddenly separated, or forced apart, there is said to be *dislocation* or *luxation*.

Joints are divided into two kinds, the ball-and-socket (orbicular), which has a rotatory motion, as the shoulder, hip, thumb, — and the angular, or pump-handle (ginglymoid), as the elbow and knee.

The ball-and-socket joints have a greater diversity of motion, and are more exposed to dislocation. They are likewise more easily put in their place.

In a Primary Dislocation, the bone is thrown at once into the place where the surgeon finds it.

The Secondary Dislocation is one in which the muscles pull the head of the bone still further from its natural place than it was thrown by the first shock of violence.

A Dislocation is Simple when there is no wound penetrating the synovial membrane.

It is Compound when attended by such a wound.

A Dislocation is Complete when the articular surfaces are entirely separated.

It is Incomplete when the separation is only partial.

Recent Dislocations are rectified with comparative ease.

Old Dislocations are hard to be repaired, and sometimes cannot be reduced at all.

The Symptoms of Dislocation are, inability to use the joint; the head of the bone being felt in an unnatural place; the limb shortened, lengthened, or distorted; a change in the shape of the joint, etc.

Simple dislocations are generally trivial. Compound dislocations often render amputation necessary, and are always perilous.

Aged persons are less liable to dislocations than the young.

When a dislocation and a fracture occur at the same time, the dislocation is to receive attention first.

A dislocation is to be reduced by a *gradual* and *continuous* extending force. The reduction is known by the limb recovering its natural length, shape and direction, and by its being able to perform certain motions which are not possible while in a dislocated state. The pain is immediately reduced upon reduction taking place. In shoulder and hip dislocations, the head of the bone makes a loud noise when it slips into its place.

Dislocation of the Lower Jaw.

GAPING very wide is the usual cause of this. It has been known to result from a mere yawn. One or both sides may be disjoined.

Symptoms. — If but one side is dislocated, the chin is twisted to one side, and immovable, and the jaws are partially open; if both sides, the mouth is wide open, the chin projects, there is a hollow in front of each ear, great pain, inability to speak, and dribbling of spittle from the mouth.

Treatment. — To effect a reduction, cover the thumbs with a towel or a piece of wash-leather to prevent their being injured by a sudden snapping together of the jaws, and then, standing in front of the patient, introduce them into the mouth, press them upon the crown of the back lower teeth, at the same time lifting the chin with the fingers.

After the jaw is set, it should be kept bandaged for a few days,—the bandage being merely passed once or twice over the top of the head, and under the chin. No solid food requiring chewing should be taken for a short time.

Dislocation of the Collar-Bone.

THIS may take place by the end attached to the breast-bone slipping *over* or *under* that bone, or by the *other* end slipping *above* or *below* the bone to which it is attached. When the first named end of the bone slips *over* the breast-bone, it is said to be a *forward* dislocation; when it slips *under* the breast-bone, it is *backward*. In this latter form of dislocation, the end of the collar-bone sometimes presses upon the gullet, and prevents swallowing.

Symptoms. — In the *forward* dislocation of the inner end of the bone, a *bunch* may be felt by the hand at the top of the breast-bone;

in the *backward dislocation*, a *depression* or *hollow*. The *upward* dislocation of the *outer* end of the collar-bone may be known by the flattened and sunken condition of the shoulder.

Treatment.— To put the bone in its place in the first of these accidents, draw the shoulders back, by which means the collar-bone (clavicle) is drawn away from the breast-bone (sternum), and easily slips into its place. To reduce the dislocation at the other end of the bone, place the knee between the patient's shoulder-blades (scapulæ), and draw his shoulders *backwards* and *upwards*. After the reduction, support the arm in a sling.

Dislocation of the Shoulder-Joint.

THE head of the long bone of the arm (humerus) may be displaced in three different directions, — *downward*, into the arm-pit (axilla); *forward*, under the muscles of the breast; and *backward*, upon the back of the shoulder-blade.

It is recognized by the shoulder losing its roundness, and becoming flat; by the lengthening of the arm; by the head of the bone being felt in the arm-pit; and by severe pain.

To effect the reduction in the first form of displacement, put the patient on a bed, or upon the floor. Put one heel in the arm-pit, against the head of the bone. Then, taking hold of the arm above the elbow, or at the wrist, pull steadily, and push with the heel. (Fig. 166.) The extension may be more steady and powerful by a double towel around the surgeon's neck.



FIG. 166.

If the reduction cannot be effected, relax the muscles by a warm bath or by etherization.

A simpler method often succeeds and is the only one required in certain forms of shoulder dislocation. Bend the elbow at right an-

gles and place it at the side of the body. Next rotate the fore-arm outward as far as possible; then carry the elbow, still flexed, inward and upward onto the chest, and then allow the elbow to fall. The head of the humerus often slips into place with the greatest of ease.

After the reduction, a sling will be required, and three weeks' or a month's rest.

Dislocations of the Elbow-Joint.

OF these there are six varieties. In the first, both bones of the fore-arm (radius and ulna) are thrown *backwards*; in the second, both are drawn *backwards* and *inwards*; in the third, both are thrown *backwards* and *outwards*; in the fourth, the *ulna alone is forced backwards*; in the fifth, the *radius is forced forwards*; and in the sixth, the *radius is thrown backwards*.

In general, these dislocations are all easily set. In the first four, the knee is to be placed at the bend of the elbow, and the fore-arm bent upon it, the surgeon grasping the upper arm with one hand, and the fore-arm with the other. In the dislocations of the radius, the upper arm is to be put in a *fixed* condition, while the surgeon takes hold of the hand and pulls, at the same time throwing the bone forward. If the luxation be backwards, there must be the same extension and counter-extension, while the fore-arm is bent.

Treatment. — The fore-arm must be placed in a half-bent position, and a splint should be bandaged upon the front of the whole limb, compresses being placed upon the head of the bones opposite the direction of the dislocation. This confinement must be continued three weeks.

Dislocations of the Wrist.

THESE are caused by falls upon the hand. Both the radius and ulna may be thrown *backwards* or *forwards* upon the wrist, causing a projection either in front or behind. (Fig. 167.) The bones are to be set by pulling in opposite directions upon the hand and the forearm, and pressing laterally, if the displacement be at the side of the wrist.



FIG. 167.

Treatment. — Put a straight splint on the front, and another on the back of the fore-arm and hand, with compresses on both sides of the wrist, and a bandage over the whole. Support the fore-arm in a sling, and keep down inflammation by cold water, cooling lotions, etc.

Dislocations of the Bones of the Hand.

SOME one of the carpal bones may be pushed up out of its place,

so as to form a projection on the back of the hand. To put it in its place, press upon it simply, and then put compresses on the front and back, with straight splints upon these and a bandage over all. Put the hand in a sling.

Dislocations of the finger-joints may generally be replaced by bending the displaced phalanx over the head of the bone from which it has been disjoined. Sometimes a good deal of extension and counter-extension are required, for which purpose a piece of cord may be wound around the finger, — the skin being protected by covering it with a piece of wetted buck-skin.

Dislocations of the Hip-Joint.

THESE are four in number, — *upwards, downwards, backwards and forwards, forwards and upwards.*

To reduce these, a greater amount of power is needed than in the dislocations of any other bone, — owing to the greater power of the muscles which are to be overcome.



FIG. 168.



FIG. 169.

Dislocations of this joint are often confounded with fracture of the head and neck of the thigh bone. This latter may be distinguished from the luxation by the grating sound to be heard, by the possibility of pulling the limb out to its natural length, and by its being shortened up again by the action of the muscles the moment the pulling is given up.

The Upward Dislocation of the head of this bone upon the back of the haunch-bone is known by the *shortening* of the limb, and by *the knee and foot turning inward*, — the foot lapping over the opposite foot, and the great toe resting upon the other instep. (Fig. 168.)

The Dislocation Downward is known by the *lengthening* of the limb, the projection of the knee, *the turning of the foot and knee outward*, and the bending of the body forward. (Fig. 169.)

The Dislocation Backward and Upward is distinguished by the *inclining of the foot and knee inward*, the drawing up of the heel, and the resting of the great toe against the ball of the great toe of the other foot. (Fig. 170.)

The Dislocation Upward and Forward is known by the shortening of the limb, and the *turning of the foot and knee outward*. (Fig. 171.)

For replacing the bone, put the patient upon a table, on his back. Draw a sheet between his thighs, and extending it up by the side of his body, let it be fastened to a staple. Put a padded belt, with rings attached, around the injured limb, just above the knee. To these

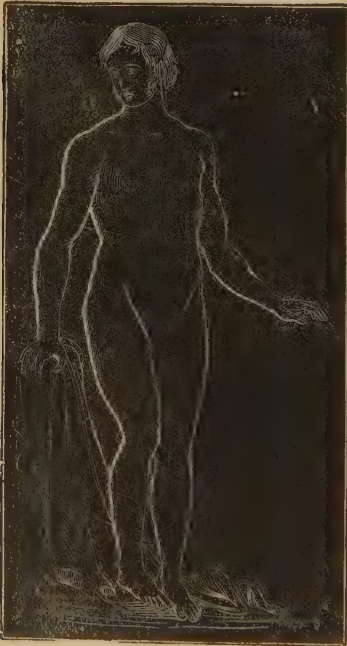


FIG. 170.

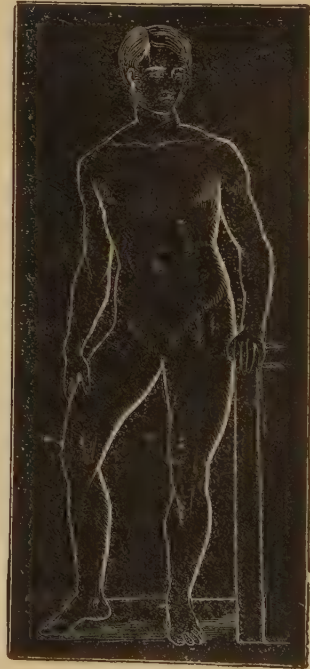


FIG. 171.

rings, fasten one block of a pulley, and attach the other to a post, giving the pulley-rope to an assistant. The surgeon now, standing on the injured side, directs gradual extension to be made, while he, by his hands, or by a band passing around the injured thigh and over

his own shoulders, lifts the head of the bone, and guides it into its socket. Etherization is not infrequently required.

Treatment. — Keep the patient in bed for two weeks or more, with his knees tied together by a strip of muslin, and a broad belt around his hips.

Dislocations of the Knee-Pan or Patella.

THIS bone may be thrown *outward*, causing a great projection on the outside, and an inability to bend the knee.

It may be thrown *inward*, causing the same impossibility to bend the knee, and a projection on the inside.

To restore the bone to its place, put the heel of the patient upon the shoulder of an assistant; then press down the edge of the knee-pan which is farthest from the centre of the joint, thus tilting up the other edge of the bone, when the muscles, aided by a lateral pressure, will draw it to its place.

Treatment. — Put a straight splint upon the back of the limb, and make moderate pressure upon the knee by a bandage. Cold water, or cooling washes, should generally be applied. Keep the patient in bed two weeks.

Dislocations of the Knee-Joint.

THERE are four of these, — *forward*, *backward*, *inward* and *outward*.

They are readily corrected by extension and counter-extension from the ankle and thigh, and pressure upon the head of the displaced bone.

Treatment much the same as for displacement of the knee-pan.



FIG. 172.



FIG. 173.

Dislocations of the Ankle.

THESE may occur in a *forward, backward, outward, and inward* direction. (Figs. 172 and 173.)

To rectify it, bend the limb, so as to relax the muscles on the back of the leg; then, while extension and counter-extension are made upon the foot and thigh, press firmly on the dislocated bone, and thus force it to its place.

Treatment. — Confine the foot and leg in splints made of thick pasteboard, soaked in hot water and moulded to the shape of the limb, with a foot-piece at right angles. Keep the patient in bed five or six weeks, and when he begins to walk, support the ankle with a roller bandage, or a laced gaiter.

Contusions.—Bruises.

WHEN any blunt, hard substance comes in violent collision with the soft parts of the body, without breaking the skin, the injury received is called a *bruise*. One of these accidents generally ruptures a great number of the very smallest blood-vessels, which let out blood under the skin, producing "*black and blue*," or livid spots (ecchymosis). What *fist-fighters* call a *black eye* is an example.

Treatment. — Cold applications at first to prevent the blood running out of the small vessels under the skin. After the inflammation has subsided, stimulating applications, as vinegar and water, alcohol, camphorated liniment, ammonia and alcohol, equal parts, and sometimes bandages.

Sprains.

A *SPRAIN* is a forcible wrenching and twisting of a joint to such a degree as to stretch and more or less lacerate the ligaments of the part, and sometimes to break a tendon, but without entirely displacing a bone. Its symptoms are, violent pain, swelling, and discoloration of the parts from the blood running into the cells under the skin. In elderly persons, the effects of sprains are very tedious, disabling them for many weeks, or even months.

Treatment. — Elevate the limb, keep the joint perfectly quiet, and apply cold lotions or fomentations. When the inflammation is all past, apply stimulating liniments, and bandages, or shower the part with cold water.

When first done, put the part, if possible, into as hot water as can be borne and maintain it there for half an hour, then strap the part moderately tight with plaster. An ice-bag applied over a joint when the hot water cannot be obtained, or is inapplicable, is nearly as efficacious.

Ruptures of Tendons.

THESE accidents are known by a sudden snap, followed by pain, loss of motion in the part, and swelling and discoloration.

Treatment. — Place the part in such a position as to relax the broken tendon, the ends of which must be brought together, and retained in contact till they grow together. They are to be sewn aseptically and the wound treated like any closed wound.

Diseases of the Bones.

THE bones are supplied with blood-vessels and nerves; and as they live and grow like other parts of the body, so they become diseased and die in like manner.

Ulceration of the Bones. — *Caries.*

BONES, like the soft parts, when attacked by violent inflammation, may ulcerate, discharge matter, and heal by granulation; or, having lost a portion of their substance, may sink under entire disorganization and death. This disease passes, in some parts of the country, under the name of “fever sore.” It is generally the result of poor blood, scrofula and like disease, and hence needs tonic, constitutional as well as local treatment, cod-oil, iron, etc.

Treatment. — Apply splints, and keep the part in a state of absolute rest. Subdue the local inflammation by the usual means. If the disease arise from scrofula or syphilis, use the remedies for those diseases.

Periostitis.

THIS term includes periostitis proper which is comparatively rare by itself, as this term means simply an inflammation of the outside lining of a bone named the periostium, and includes the inflammation of the bony substance called osteo periostitis and the marrow of the bone called osteo myelitis. They usually result from cold, blows, contusion, strains, adjacent inflammation, as very old ulcers, or from special constitutional diseases such as syphilis, tuberculosis or pus in the system called pyæmia. The symptoms may be very mild in the beginning, especially if the cause is not one of injury. Pain and swelling, usually of a deep boring character like a gimlet being screwed into the bone, occurs and is worse at night. The parts are extremely tender, often reddened and inclined to leave an impression of the finger when pressed upon.

Treatment. — It is very desirable to have absolute rest of the part at first and the application of heat or cold, whichever is more agreeable.

may be used; should destruction of the tissue go deeper, the treatment will be prompt incision and letting out the pus that is making the trouble. Poultices, hot antiseptic solutions and irrigation to wash away the old dead discharge may prevent death or necrosis of the bone, which will require a more extensive operation.

Death of the Bones. — *Necrosis.*

THIS is like mortification of the soft parts. It occurs from injuries and inflammation of the periosteum.

It is known by dull, deep-seated — sometimes acute — pain; and is followed by increase of size, from the formation of new bone around the old, — the old being gradually broken into pieces, and discharged through external openings.

As blood poison may often result from absorption of dead bone tissue that has not had a proper outlet, it is usually the best treatment to make an incision over a swelling in bone troubles, should pus be suspected. If made under the antiseptic conditions already advised, the improvement will be noticed when the pus escapes, and the local condition, which is severe enough looked at from any direction, will remain as it is and not go into a general body infection which may cause death or lead to amputation at a much higher level than would have been the case.

Treatment. — Poultices and quieting fomentations. Resort will generally be made to surgery.

The greater the amount of bone involved the larger amount will have to be removed, and as no healing may be expected, as long as any infective material remains, all bone that is in any way diseased must be scraped or even chiseled away. Nature is very kind in restoring bone and if only the outside shell of the large bones, like the tibia or shaft of the lower leg, remains, it will fill in by granulation and make a sound bone.

Unnatural Growth of Bones. — *Exostosis.*

THIS disease consists either of a tumor of a bony nature, growing upon and arising from a bone, or an enlargement of a bone. It springs from the periosteum, or from the surface of a bone, or from its spongy texture. The enlargement or the tumor may be white and hard, like ivory, or dark-colored and spongy, or a mixture of the two.

At first, a tumor of this kind is not attended with pain or inconvenience. It comes on slowly, and sometimes remains nearly stationary for several years.

Treatment. — If the tumor be large and inconvenient, remove it with the knife. If not, use local pressure with pads and bandages.

Diseases of the Joints.

SOME of these diseases begin in the cartilages, some in the synovial membrane, and others in the heads of the bones.

Disease of the Hip-Joint. — *Coxalgia*.

THIS generally consists in inflammation of the synovial membrane and capsular ligament of the hip-joint, ending frequently in ulceration and destruction of the head and neck of the thigh bone.

The symptoms are fullness in the groin; pain, which is increased by motion; aggravated when the limb hangs without touching the ground; is more felt in the knee than in the hip itself; and shoots down along the inside of the leg, as far as the instep. The thigh inclines forward, and the limb has the appearance of being longer than the other, — though in the latter stages, it is really shorter.

Treatment. — Before suppuration takes place, apply heat and friction, and enjoin perfect rest. After suppuration, keep the patient upon his back, on a mattress, and mould to the parts thick paste-board splints, with pads, and give tonics. Keep the bowels open with senna and bicarbonate of potash, and rub the parts with iodide of potassium ointment, or with preparations (195), (196), (197). The disease being scrofulous, the iodide of potassium (140) may be taken with advantage internally. The disease occurs for the most part in children. They should be put on a long splint from the very first and the joint kept immobilized.

White Swelling. — Synovial Degenerations.

THERE are several diseases of the knee-joint, characterized by swelling and white color from tension of the skin, which have passed under the common name of *white-swelling*. The diseases are not strictly the same, but as they all affect the knee, and have symptoms to some extent in common, it is well enough to group them under the same title, — especially as one treatment is adapted to all.

One is a pulpy disease of the synovial membrane. It begins with a trifling stiffness, and a slight swelling. The swelling increases by degrees, and on touching the part there is a sensation as if it contained fluid. By and by the cartilages ulcerate. The disease is incurable, as the synovial membrane is finally converted into a pulpy substance, and the limb has to be amputated.

Another of these is inflammation of the synovial membrane, beginning with ulceration of the cartilages. It begins with pain in the joint, which is severe at one point, and attains its height in a week. In a day or two, the joint is swollen from a collection of water.

Treatment. — Splints and entire rest, as in all chronic diseases of

the joints. Also a generous diet, and whatever is calculated to build up the health. For the tubercular variety an injection of iodoform dissolved in glycerine is most commonly used.

Bunions.

THIS is an inflammation, enlargement, and hardening on the inside of the ball of the great toe. It is frequently connected with a distortion of the toe, which seems partially out of joint. The projection of the joint exposes it to great irritation from the shoe, and to repeated attacks of inflammation. It occasions great suffering.

Treatment. — Remove the pressure from the part, and when there is inflammation, keep the foot quiet and elevated upon a chair, applying heat, poultices, etc. Another method is to cover the bunion



FIG. 174.

with soap-plaster, spread on thick, soft leather, or, put the toe in a separate compartment of the stocking, like the finger of a glove. Then enclose it in a separate part of the shoe, which is contrived by fixing

a piece of firm sole-leather in the bottom of the shoe, so as to make a separate compartment for the toe. By this means the pressure against the side is removed. Sticking plaster may be spread on wash-leather, and a piece cut out the size of the bunion. This will take off a portion of the pressure of the shoe, and will hasten the cure.

Fig. 174 represents a ganglion or tumor formed upon the synovial sheath of the tendon which bends the finger.

Whitlow. — Felon. — *Paronychia*.

THIS is an abscess of the fingers, of which there are three kinds, — the first situated upon the surface of the skin, the second under the skin, the third within the sheath which contains the tendons of the fingers, and sometimes involving the covering of the bone.

The latter form of the disease is the most terrible, and begins with redness, swelling, and a deep-seated and throbbing pain, which gradually becomes so excruciating as to banish all sleep, and nearly drive the patient to distraction. Finally matter forms and burrows in the deeper parts of the finger, and at length finds an opening, which brings relief.

Treatment. — Carry the hand in a sling; apply a bandage and use poultices. A poultice made of equal parts of powdered slippery-elm bark, poke-root, ground flax-seed and lobelia-seeds, mixed with hot lye, and changed twice a day, is an admirable application.

When these methods fail to stop the progress of the abscess, the finger should be laid open with the scalpel, cutting down to the bone. This will give vent to the matter, and the wound may be dressed with poultices, until the inflammation is subdued, and the healing process is well established, when some simple salve may be applied.

Stiff Joint.—*Anchylosis.*

THIS is of two kinds, *complete* and *incomplete*,—complete when the bones of the joint have become firmly united by bony matter, and incomplete when the motions of the joint are very much interrupted, but not entirely destroyed. The first is the result of ulcerations of the cartilages of the joints, and of the heads of the bones; the latter, of fractures, sprains, bruises, thickening of the synovial membrane, and weakening of the muscles.

Treatment.—No treatment is of much use in the first-named form of the disease. By sawing through the bone, and then daily moving the limb back and forth, a false joint may be made, but it is apt to grow together again, and finally defeat the purpose of the surgeon. When, however, stiffness arises from the weakening of the muscles, and some other causes involving the ligaments and tendons, something may be done by daily frictions with stimulating liniments, champooing, and warm fomentations; and by gently bending the joint back and forth, several times every day, as much as can be done without pain.

Tumors.

A TUMOR is a swelling which consists of a *new production, not constituting any portion of the original structure of the body*. There are several kinds of tumors; but it is sufficient for my purpose to follow Mr. Ferguson, and divide them into the *malignant* and *non-malignant*.

Cancer.

THIS belongs to the class of malignant tumors. It has two stages. The first is that of *induration* or *scirrhus*, during which it has, under the finger, the feeling of *stony hardness*. The second stage is that of *ulceration* or *open cancer*.

Cancer most often attacks the female breast, the skin, the mucous membranes, the tongue, the stomach, the neck of the womb, the lips, etc. It rarely occurs in subjects under thirty years of age, and not often in persons under forty-five.

The Symptoms of Cancer, when it appears in the breast, are, a puckered condition, and dull, leaden color of the skin; a hard, knotty, and uneven feel; and occasionally sharp pains. When it attacks the skin and mucous membranes, there is a hard, warty lump, which

ulcerates, after a time, producing an open sore, with a hard base. (Fig. 175.)

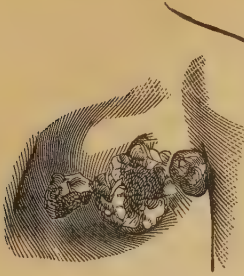


FIG. 175.

The sore of a cancer discharges an irritating, excoriating matter, which has a peculiarly fetid odor, so offensive and so different from any other smell, that it is seldom forgotten. The bones of a cancerous person break with great ease. Unmarried females are much more liable to the disease than the married. The cancerous growth is composed, in part, of cells, rounded or caudate, containing, as seen under the microscope, nuclei,

younger cells, and granules. (Fig. 176.)

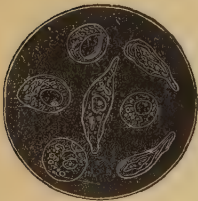


FIG. 176.

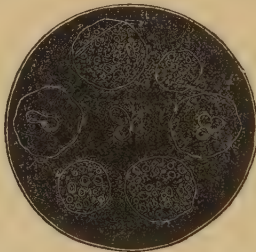


FIG. 177.

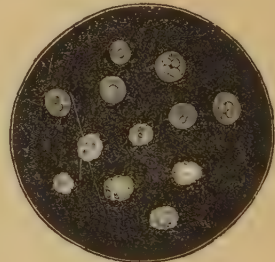


FIG. 178.

The difference between these cells and those of common pus-globules may be seen by comparing Fig. 176 with 177,—the latter being pus-corpuscles highly magnified by a powerful microscope. Fig. 178 represents pus-globules not so much magnified.

Treatment. — There are but two methods of treatment which promise any success. The first is to extirpate the tumor by a surgical operation before the disease has so far invaded the constitution as to be sure of returning. The other is that adopted by Dr. J. W. Fell, an American physician, who was permitted to try his remedies in one of the English hospitals, and who drew from the surgeons in charge of it a favorable report of the results.

Dr. Fell's remedies are mainly blood-root and chloride of zinc (336) made into a paste. The skin over the tumor is first destroyed, and this paste, spread upon strips of linen, is applied. This causes an eschar, into which incisions are made, half an inch apart, taking care to avoid the living tissue. The same paste spread in a like manner is then daily inserted into the furrows. By this means, which is original with Dr. Fell, the effect of the caustic penetrates through all parts of the tumor, causing the whole diseased mass to fall off, and leave a healthy, granulating surface.

In incipient cancer, where the disease has not made much progress,

Dr. Fell uses the above, which he calls a brown ointment (336), and in connection with it an ointment of the iodide of lead (337), using each twelve hours. With these, he claims that he cures incipient cancers with great readiness. He also employs, internally, half-grain doses of pulverized blood-root (143), with arsenic and cicuta.

Dr. Fell claims that with these preparations, he has often cured *lupus*, and has been very successful with them in treating indolent ulcers. Of late a new treatment has sprung up—namely, the injection of anti-cancer serum, but as yet a definite opinion cannot be given as to its results. The latest remedy that holds out any hope is in the use of the x-ray, Finsen light, or radium. The action of this agency will be explained at the end of this chapter. It is not possible that they can be successful in deep seated cancers at the present state of their usefulness, and it may be said that the hopes that were at first held out for them, together with the anti-cancer serum are not being fulfilled; but their success has been brilliant in certain varieties, especially skin cancers and *lupus*.

Soft Cancer. — Bleeding Cancer.

Medullary Cancer.—Encephaloid Tumor.—Fungus Hematodes.

THIS varies in size from that of a nutmeg to a child's head. Its color varies from white to deep red. At times it is soft and elastic at first; at other times, it is firm and tense. The patient is wan and pale from the beginning. The parts do not ulcerate, as in *scirrhus*; but after the skin is broken, a spongy, bleeding tumor protrudes.

Treatment. — Dr. Fell's method.

Black Cancer. — *Melanosis*.

THIS is an organic disease, in which the tissue of the disordered part is converted into a black, hard substance, which is converted into ulcerous cavities. This often appears in the lungs, and is met with in the liver and other parts.

Its symptoms are, a sallow complexion, great debility, and dropsical swelling of the limbs before the termination.

Treatment. — When it appears externally, Dr. Fell's treatment is worth a trial. When in the lungs, the inhalation of tincture of blood-root and solution of chloride of soda (241) should be used. Two teaspoonfuls may be put in a Vapor Inhaler,—the instrument being filled half full of hot water,—and inhaled ten minutes, three times a day; the blood-root pills (143) being taken at the same time.

Fatty Tumor.—*Lipoma*.

THIS is the most common of all the forms of tumor. These bodies

generally have a soft and doughy feel, or as if filled with wool. They are the least inclined to become malignant, and consequently the least dangerous, of all the tumors. Whatever pain there is, is caused by their size, weight, and pressure. They are occasionally found a little below the point of the shoulder, in the deltoid muscle of females, and are caused by the unreasonable pressure of the dress at that point.

Treatment. — They should be removed by an operation, which is easily performed, as they separate very readily from surrounding parts, shelling out of the capsule that surrounds the tumor like an egg from its shell.

Polypus.

THE *polypi* constitute a class of tumors growing from mucous membranes. They are of two kinds, — the *soft, jelly-like* polypus, and the *fleshy or fibrous* polypus.

The Soft Polypus, which grows from the nose, has not much feeling, and is not particularly disposed to bleed.

The Fleshy Polypus is firmer and harder than the preceding, and most generally connects itself with the womb.

Treatment. — Both kinds of polypi are either twisted off with a pair of forceps, or strangled by putting a string, called a ligature, around their neck, which will cause them to fall off in a short time.

Piles. — Hemorrhoids.

THESE venous swellings often cause so much pain and trouble, are so often chronic and unyielding to medical treatment, that surgical interference becomes now and then a necessity. The operation for their relief and cure is an extremely common one, and nowadays is limited to a very few different methods.

The *carbolic acid* treatment which has found favor with many consists in the injection into the pile of a small amount of carbolic acid dissolved in glycerine or water. The process is simple and almost painless, especially if done after numbing the parts with a three per cent cocaine solution. The carbolic coagulates the blood and albumen of the tissues and causes a death of the parts with a subsequent sloughing and puckering. The advantage of this procedure lies in the ability of the patient to be up and about. The danger lies in the risk of setting free a clot in the circulation, causing most serious consequences and even death. It should be used only in selected cases and then not too freely. Not over a stronger solution than two per cent. in strength should be used.

A second method, and by far the oldest, is to encircle the pile with a *ligature* and allow it to eat through, thus destroying the pile and

causing it to heal behind the ligatures. This method is painful, requires ether and necessitates rest in bed. A third way is to burn off the pile by means of a *cautery and clamp*. It is far preferable to the ligature, requiring but a few days' stay in bed, and is less painful. A fourth, and the most scientific method, is one just coming into prominence, and consists in *dissecting out the pile area* and sewing the flaps of mucous membrane and skin together.

Numerous washes, ointments, and lotions have been used to temporize, but the only sure and thorough way to treat obstinate piles which remain after continued and unsuccessful attempts to remove the original cause, is to remove them once for all. The following salve will be found useful: cocaine, eight grains; gall ointment, half an ounce; mix. Smear well over the piles and then push them up into the bowel. Piles should always be returned into the bowel when possible; this of itself, when practicable, oftentimes constitutes a cure.

Whenever a small, round, hard pile is seen on the outside and is very painful, it should be incised, after numbing with a cocaine solution, and the clot turned out. This simple and painless procedure works great relief and often a cure.

The bowels are to be kept open daily by a solution of the citrate of magnesia (one-half bottle), which keeps the bowels loose and causes no pain in defecation.

Wens. — *Encysted Tumors.*

THE most common situation of these is under the skin of the head. A wen is simply a sac full of various matters, which, when examined with a microscope, are found to be oil-globules, epithelial cells, and crystals of stearine. These contents are secreted by the internal surface of the sac. They sometimes look like curd or rice, sometimes like suet, and sometimes like honey. In other instances, they are mere water, and they have been known to consist of hair or horn. These tumors are round, elastic, and movable, and are without pain. They grow slowly, but steadily.

Treatment. — The attempt to excite inflammation and consequently absorption, by punctures, setons, or injections, are dangerous, and ought not to be resorted to. If the tumor is small, its opening, indicated by a small black spot, may be found, a probe be introduced into it, and the contents of the sac be squeezed out; and this may be repeated as often as necessary. But the proper and only real remedy for these tumors is their removal by a surgical operation, which, under aseptic rules, is painless, easy and sure.

Aneurisms.

AN aneurism is a tumor formed by arterial blood, and communicating with an artery. A *true aneurism* is formed by the coats of an artery getting weakened by some cause, and swelling out so as to form a pouch or sac. (Fig. 179.) There are other kinds of aneurisms, which need not be described.



FIG. 179.

Symptoms. — An aneurism may be felt as a tumor somewhere along the course of an artery, and it beats under the finger like the pulse. The beating is caused by a fresh quantity of blood being pushed into this sac with every stroke of the heart. If it be small, pressure on the artery above it will so far shut off the blood from it, that it will feel flaccid or soft. The patient will often say that the tumor began to appear after some violent strain, when something appeared to give way. In the chest, aneurism will produce an unnatural pulsation felt by the patient. In the belly, it may generally be felt as a tumor through the abdominal walls.

Distinction. — Tumors which lie directly over arteries are lifted up every time the blood is driven along under them, and hence they pulsate like aneurisms; but they *do not pulsate when small*, whereas aneurisms do from the beginning of their growth. Aneurisms are *soft at first, and hard afterwards*; whereas tumors are generally hard at first, and finally soft.

Treatment. — In some few fortunate cases, aneurisms get well spontaneously. If the flow of blood through them can be stopped, that which is within them will coagulate, forming a hard tumor, which will gradually waste away. To cure them, therefore, we must stop the circulation through them; and this may be done, in some cases, by compression. The pressure upon the artery must of course be above the tumor, and should not be so great as to stop the blood altogether, but only very materially to *diminish* its flow. The pressure is applied by an instrument having two pads, an arc of steel, a joint in the middle, and a screw by which the padded extremities are pressed together. (Fig. 180.)

When this mode of treatment is not practicable, the artery must be tied between the aneurism and the heart. The patient should be placed in bed, with the limb wrapped up to preserve its temperature,

and placed in an easy position. Nothing cold should be applied to it. The force of the circulation should be reduced by the tincture of veratrum.

Bronchocele. — Derbyshire Neck. — *Goitre*.

BRONCHOCELE is what is called an *endemic* disease; which means, *a disease which prevails in certain localities*. This complaint is prevalent in Nottingham and Derbyshire, England, among the Alps, and especially in the Tyrol and valley of the Rhone. It is thought to be produced by the use of melted snow, and water impregnated with lime and earthy matter.

Symotoms.—A prominent, soft, elastic tumor, occupying the front of the throat, in the situation of the thyroid gland, and like it in shape. It is not tender, and the skin is not discolored. In old cases, the tumor becomes hard. In Fig. 181 the tumor is so large as to have pushed the gullet to one side.

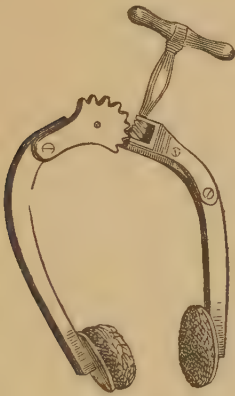


FIG. 180.

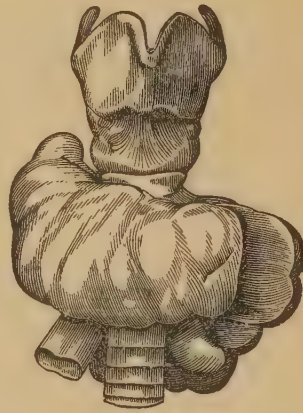


FIG. 181.

Treatment.—The usual and perhaps the best remedy for this disease is iodine. It may be given as iodide of potassium, with a bitter or some other article (138), (145), (101). An iodine ointment may be applied to the tumor (185).

The patient should move away from the infected district, and **re-side, if possible, upon the sea-coast.**

The use of the thyroid gland of the sheep given in 5-grain tablets is the best treatment which can hold out any promise of cure.

Water in the Scrotum. — *Hydrocele*.

As the name shows, this is a collection of water in the scrotum or bag which holds the testicles.

Symptoms.—It presents a swelling, shaped like a pear, smooth

on its surface, fluctuating if pressed, without pain, but causing a little uneasiness by its weight. On placing a lighted candle on one side of the scrotum, the light may be seen through it.

Distinction. — This complaint may be distinguished from a solid enlargement of the testicle by its not being so heavy, solid, or painful, and by its fluctuating and being transparent; from rupture, by its forming slowly instead of suddenly, by the swelling beginning at the lower part of the scrotum instead of the upper, and by the enlargement not being increased by coughing as it is in rupture.

Treatment. — In children, strong scattering washes (353) are sometimes successful. But most commonly a number of punctures are made with a large needle, to cause the fluid to escape into the cell tissue of the scrotum, whence it is removed by absorption.

To effect a radical cure in grown persons, the surgeon is to grasp the tumor behind, and introduce a trocar and canula into the sac, — being careful to point the instrument upwards, so as not to wound the testicle. The trocar is then withdrawn, — the canula being at the same time pushed well into the sac, so that none of the fluid may get into the cell-tissue outside the sac. The fluid runs off through the canula. When this has all escaped, some stimulating fluid, as common lime-water, or, still better, tincture of iodine, is to be injected through the canula into the emptied sac. After retaining this from two to five minutes, it is permitted to flow out. Inflammation follows, which breaks up the secretion of water, and effects a cure in two or three weeks. The amount of fluid thrown in should be about one or two teaspoonfuls of a mixture of one part of tincture of iodine and two parts of water. If the first operation does not effect a complete cure, it may be repeated. The most successful of all treatments, however, is to open the scrotum and dissect out the greater part of the tissue which covers the testicle and which secretes the fluid.

A suspensory bandage which, by relieving the weight from the spermatic cord will cause great relief, is desirable and in early cases may prevent the troubles becoming serious enough to warrant operation.

Blood in the Scrotum. — *Haematocele.*

THIS is a collection of blood in the scrotum, from some injury.

Treatment. — If the quantity of blood effused be small, cold applications may cause it to be absorbed. If it be large, make a puncture, and apply a poultice for the blood to ooze into.

Acute Inflammation of Veins. — *Phlebitis.*

THE veins are subject to attacks of acute inflammation, which constitutes a very dangerous, and often fatal, disease.

Symptoms. — Fits of shivering, or perhaps fainting, a rapid pulse, anxiety of countenance, lowness of spirits, catching pains about the heart, and *swelling, redness, tenderness and hardness along the course of the affected veins*. Sometimes the tongue is furred brown or black, the skin is sallow, there is bilious vomiting, low delirium, and death. In cases less rapid, there are great swelling and redness over the diseased veins, and abscesses form, which, when opened, reveal clots of blood mixed with pus. Or, the patient, while remaining low, with a sallow countenance, and a yellow tongue, will complain suddenly of intense pain in some joint, as the knee or shoulder, — in which there will be a rapid formation of pus; a similar suppuration will follow in other joints, as well as in the lungs, etc., until the patient sinks, and dies of exhaustion.

Treatment. — Apply leeches freely over the inflamed veins, — also fomentations. Every abscess should be opened early. Keep the bowels moderately open with some preparation of salts, and allay pain and restlessness by morphia. Support the strength by beef-tea, etc.; and, if the pulse be feeble, give wine or quinine.

The suppuration may be checked, in this as in other complaints, by drinking freely of chamomile tea. The power to control suppuration has recently been discovered as belonging to chamomile flowers.

Chronic Phlebitis.

THIS is a far less serious disease than the preceding. It generally affects the veins of the legs.

Symptoms. — Tenderness and hardness of the affected vein, with swelling around it, and of the parts below; a general painfulness of the limb. After the inflammation has subsided, the vein feels hard, like a cord, because the inflammation causes the blood within to coagulate, and harden, so that nothing can pass through the vessel.

Treatment. — Leeches, fomentations or cold lotions, as the patient may choose, purgatives and rest, with the limb elevated. Subsequently, when the inflammation seems completely subdued, friction with camphorated oil and bandages.

Enlarged or Varicose Veins. — *Varix*.

THE veins which lie near the surface, especially those of the legs, are apt, by exhausting labor upon the feet, and by strains, to get weakened, so that their valves lose their tone, and their sides stretch and give way in certain places, letting the blood bulge out, and form purple bunches. These bags of blood, lying along upon the surface of the limb, form knotty tumors, looking like blood-boils. They occasion a kind of distress, but no sharp pain.

Persons of weak, soft and relaxed muscles and blood-vessels are

particularly liable to this complaint. It often attacks women in the family way.

Treatment. — Where only a few veins are affected, it may be sufficient, in some cases, to apply firmly over them a few strips of leather, spread with soap-plaster. But generally it is better to support the whole limb with a good woollen bandage, or with a laced stocking, which should be applied in the morning before the patient is up. It is generally well, also, to use friction, with some liniment, or iodine ointment. Lead-water, or alum-water, or an infusion of white-oak bark, may be used with advantage. Burdock and plantain leaves, bound upon the skin, and removed before they are dry, are useful. Showering with cold water strengthens the veins. An elastic silk stocking made for the limb is the best general measure.

Rupture. — *Hernia.*

HERNIA signifies a protrusion of any internal organ from the cavity where it belongs; but the term is generally restricted so as to mean no more than *a protrusion of the bowel through the walls of the belly.*

When the abdominal walls are weak, from any cause, no matter what, — lifting, straining, or making violent muscular exertion of any kind, will then often cause the bowel to force itself through at the most debilitated spot; and pushing the lining of the belly, the peritoneum, along before it, a bag or sac is formed, in which the projecting bowel is enclosed, forming an external tumor.

Divisions of Hernia. — Rupture may occur in several different places, and has accordingly received different names.

Umbilical Hernia is a protrusion of the bowel at the umbilicus or navel. This is most common in children soon after birth; and women who are often pregnant are liable to it.

Ventral Hernia is that which occurs at any part of the belly where other forms of rupture do not appear.

Inguinal Hernia is that in which the bowel protrudes at the groins, or through the abdominal rings.

Scrotal Hernia is that in which the bowel descends into the bag or scrotum.

Femoral Hernia is the dropping down of the bowel behind what is called Poupart's ligament, and appearing as a tumor at the upper part of the thigh.

Reducible Hernia. — Rupture is said to be *reducible*, when the bowel may be put back into the cavity from which it came.

Irreducible Hernia. — Hernia is called *irreducible* when the protruding bowel cannot be returned into the belly.

Strangulated Hernia is that form of the complaint in which the bowel is so pressed upon at the point where it passes through the walls of the belly that it is *strangled* or *constricted* so that its contents cannot pass through.

Symptoms of Hernia. — A soft tumor, which may be compressed, appears somewhere about the belly; and is increased in size when the patient stands up. It also swells when he coughs, or makes any exertion; and grows smaller, or entirely disappears, when he lies down.

Treatment. — In a case of *reducible* hernia, the first thing to be done is to put the bowel back in its place, which is accomplished by gently pressing and kneading the tumor, and swaying it back and forth, — being careful to use no violence, — until it can be pushed within the abdominal walls. It is then to be kept in its place by the use of a truss, made expressly to fit the case. This instrument should be constantly worn by day, and by night, too, if not too irksome; but if worn by day only, it should always be applied before rising in the morning.

Irreducible Hernia may be *palliated* by wearing a truss with a *hollow pad*, which will so evenly and firmly embrace the tumor as neither to irritate it, nor permit any further protrusion or enlargement.

Strangulated Hernia. — If a person has worn a truss for some time, and suddenly leaving it off, makes some violent exertion, either the bowel or omentum is liable to be suddenly forced through a narrow aperture, and to become *strangled*. In such case, the patient has flatulence, colicky pains, a sense of tightness across the belly, and a desire to go to stool, but no ability to pass anything. Then follows vomiting, first the contents of the stomach, then mucus and bile, and, lastly, the fecal matters from the bowels, which are not permitted to pass on to their natural outlet. The neck of the hernial sac now becomes swelled, tender and painful, the countenance is anxious, and the pulse small, hard and wiry; and, after a time, the tumor begins to mortify, the patient expresses himself free from all pain, and soon after dies.

In the treatment, the bowel is to be returned if possible. To do this, the bladder should first be emptied with a catheter, and the patient should lie down with his shoulders raised, and both his thighs bent towards the belly, and placed close to each other, so as to relax all the ligaments and muscles of the belly. The surgeon may now work gently for half an hour, if necessary, trying to put the bowel back, but must be very careful not to excite inflammation by any violence.

If he does not succeed, efforts are next to be made still further to relax the muscles, as well as to reduce the force of the heart's action, and to diminish the size of the tumor. With the tincture or fluid extract of *veratrum viride*, the heart's action and force of the circulation may be reduced to any desirable extent.

To reduce the tumor, apply pounded ice in a bag, or a freezing mixture (354.) If the pain be acute give large doses of opium or morphia. Ether is generally required to reduce a hernia.

If all these remedies fail, there is then no hope but in relieving the stricture by a surgical operation, which must not be deferred too long.

General Directions.—Rupture is an exceedingly common affection. Perhaps every third or fourth person suffers from it more or less. Females, from motives of delicacy, are apt to conceal the misfortune, and not seek advice. This exposes them to danger. Queen Caroline, wife of George II, lost her life by such concealment.

A swelling coming on suddenly in the groin or at the navel, after considerable exertion, may be taken to be a rupture without much fear of mistake.

The complaint being discovered, the bowel should be put back in its place, and a truss be put on at once. In the case of young persons, a truss may frequently effect a cure; but, that it may do this, it should not be taken off, night or day, except to cleanse it, and then only when the wearer is in bed.

Those who can afford it should have two trusses of the same size and strength, so that if one get out of order, the other may take its place while it is being repaired; for an hour's absence of the truss might occasion a mischief which it would require months to repair.

Persons having a rupture must be very careful to keep costiveness at a distance; for straining at stool is highly injurious.

Varicocele. — Cirsocele.

THIS is an enlargement or varicose state of the spermatic veins and may be mistaken for hernia, inasmuch as standing and coughing increase it. But it feels like a bag of worms; and by this peculiarity may be distinguished from rupture.

Treatment.—Wear a suspensory bandage. Have an operation done if this fails to relieve.

Deformities and Irritations of the Spine.

Lateral Curvature.—There are several varieties of curvature of the spine. Some of them are caused by the destruction of some portion of the spinal column by disease. It will not be necessary for me to treat of these forms of curvature, as they can only be investigated and treated by the most skilful surgeons. Those who will use this book chiefly, would hardly think of meddling with them.

The curvature which arises from debility of the bones, ligaments, and muscles, and which is very common among females, has the following

Symptoms. — At first there is a projection of one collar-bone, or one side of the chest, or one shoulder is considerably elevated, and is popularly thought to be "*growing out.*" On examination, the right shoulder and the right side of the chest will be found, generally, to be rounded and lifted up, while the other is sunk down and concave. At the same time, the left hip sticks out, and the loins on the right side have an inward curve. The spinal column will have a curve, as in Fig. 182.

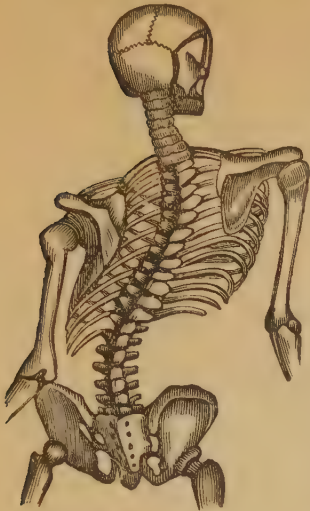


FIG. 182.

Causes. — This affection is caused by occupations which keep the body in a laterally distorted position, and tax one side of the body more than the other. It is produced in children who study their lessons at school with one elbow resting on a high desk. The muscles, too, get so weakened in many females of

luxurious, sedentary and indolent habits, that they cannot hold the bony frame of the body in an upright position, and the jointed column of bones, called the spine, sags down to one side, and draws the whole skeleton of the trunk out of shape.

Treatment. — The first thing to be done is to learn what particular attitude of the body has occasioned the distortion. This discovered, every possible effort is to be made to break up the habit, whatever it may be. If it be standing on one foot, or sleeping on one side, or reading or writing with the elbow high, keep a constant watch and strict rule over the patient.

Exercise in the open air should be free, and taken daily. The use of the dumb-bells is excellent for both sexes; but girls should, in addition, have all the variety of elegant exercise furnished by calisthenics. Wealthy parents, whose daughters are tenderly bred, should *never* let them grow up without the invigoration which these exercises impart.

When the curvature is marked, and the debility considerable, these vigorous exercises should be taken for a time with moderation, and the patient should lie down and rest immediately after taking them.

In many cases considerable benefit is derived from the mechanical support afforded by supporters of various kinds. These are now constructed and adapted to the body, with considerable skill, by those who make their construction a study and a business.

Spinal Irritation. — The spinal column is liable, at certain points, to become congested, and consequently sore and irritable.

Symptoms. — The symptoms of this state of things are very variable and numerous, as all sorts of sensations of the skin, from utter numbness and insensibility up to the most acute sensitiveness, described as creeping, shooting, coldness, tingling and the crawling of ants. There may be neuralgic pains, spasm, cramp, trembling or palsy of the voluntary muscles; or a fixed pain and tenderness in some joint or other part; or palpitation of the heart, dizziness and wind and pain in the stomach.

When any of these symptoms appear, and cannot be traced to any other cause, we are to suspect some irritability of the spinal column, and to search, accordingly, in that direction. The proper method of search is, to make firm pressure on each of the projections of the spine, and to pass over the projections a sponge wrung out of hot water. If there be trouble here, the patient will now be likely to complain of severe pain at some one point. Or, the tender place will generally be found sooner, by tapping with the ends of the fingers, with quick and sharp strokes along upon the projecting bones of the spine. The patient will be pretty sure to wince when the tender point is reached.

Treatment. — Apply a medical electric battery or stimulating liniment, or some strong, slightly irritating plaster, and the tenderness will be very likely to disappear, as if by magic.

Wry Neck.—*Torticollis*.

IN this complaint, the head is drawn over towards one of the shoulders, with the face generally turned towards the opposite side. This is caused by the rigid contraction of a particular muscle. In some instances, however, other muscles are affected, and the head may be drawn in other directions, or be twitched about in various ways.

I had a singular case from New Hampshire, which, though not exactly wry neck, was a kindred disease, and is worthy of being mentioned. The subject of it was a young lady of good physical development, but inclined to nervous complaints. Her head was chiefly drawn over backwards, sometimes so as to lie for a short time flat upon the back, with no power to raise it. She was obliged, ordinarily, to let her head lean a little to one side, and rest upon the hand, in order to keep it steady. When walking, with the head erect, without this support, it was every few moments jerked over backward and a little to one side, the chin being thrown up in a most unseemly way. The case partook of the nature of chorea.

Treatment. — For the genuine wry neck, where the muscle which draws the head to one side is rigid and inflamed, the treatment should consist of heat, poultices, purgatives, friction and alteratives. When the muscles causing the distortion are not rigid, electro-magnetism, or the shower-bath, may have a good effect. In some cases, strychnine will do well.

The peculiar case mentioned above completely recovered, under the use of the extract of St. Ignatius' bean (95), one pill three times a day, and gradually increased to nine pills a day. She also took iron, and was put upon a most energetic system of out-door exercise. Considering the stubborn and severe nature of the complaint, her complete recovery was as unexpected to her friends as it was gratifying. As the majority of wry neck cases are due to muscular contraction of a rheumatic type, the remedies employed for that disease should be used here. In all cases the hot applications should not be lost sight of.

Foreign Bodies in the Eye.

WHEN a person complains of some substance in the eye, the inside of the lower eyelid and lower portion of the ball should first be examined, the person being directed at the same time to look up. If nothing be discovered there, the patient is then to be directed to look downward. This will expose to view the upper part of the globe. At the same time, the eyelashes should be taken between the thumb and finger, and the lid turned upward over some round smooth thing, as a pencil, which will turn the lid wrong side out, and bring to view whatever is on the inner surface. Any foreign body discovered may be removed by wiping it off with the head of a pin, having a silk handkerchief turned over it. If this fails to detach it, it may be carefully picked up by running under it the point of a wet tooth-pick.

Stye. — *Hordeolum*.

A STYE is nothing more nor less than a small, painful boil at the edge of the eyelid.

Treatment. — In severe cases, apply a poultice; and open it as soon as it begins to point. After it has discharged all it is likely to, apply, on going to bed, for two or three nights, a little diluted nitrate of mercury ointment. Tonics and alteratives are frequently required to break up the formation of styes.

Inflammation of the Edge of the Eyelids.

Ophthalmia Tarsi.

THIS inflammation often involves the Meibomian glands, which then secrete a sticky mucus, which, not being wiped away during sleep, glues the lids together, so that, on waking in the morning, the patient cannot get his eyes open. The complaint is generally chronic and obstinate, lasting a long time. Weakly persons, with disordered digestion, are most subject to it. In some cases the lids ulcerate, and the lashes fall out. Generally the lids are considerably inflamed for a few days, and then, the inflammation subsiding, branny scales, which may be brushed off, form along the borders of the lids, at the roots of the lashes.

Treatment.—The health being generally disordered, needs first to be improved by all possible means, as by alteratives, tonics, bathing, exercise in the open air, travelling if practicable, and a generous diet.

While the lids are inflamed, they should be bathed by a wash composed of sulphate of zinc, twelve grains; laudanum, two drams; and soft water, twelve ounces. The redness and heat having subsided, and the bowels being opened by a gentle dose of physic, an astringent wash should be applied once or twice during the day (208), (209), and a small piece of the diluted nitrate of mercury ointment be rubbed along the borders of the lid, with a pencil-brush at night. This will generally effect an immediate improvement, and in time will bring about a cure.

Disorder of the Lashes.

Trichiasis.—This signifies a growing inward of the eyelashes.

Dystrichiasis.—This is a double row of eyelashes, one of which grows inward.

Treatment.—Pull out the misplaced hairs, and continue to do so as fast as they appear.

Ptoxis.

THIS is a falling down of the upper eyelid, from palsy of the third nerve. It is sometimes attended with headache and dizziness, and may be the forerunner of apoplexy.

Treatment.—Begin the treatment with purgatives, and then use every means to improve the health, especially exercise out of doors. As this trouble is the result of one of several diseases, the proper remedy would be that which is applicable to the disease. If due to syphilis, mercury and iodide of potash must be used in appropriate dosage; if due to rheumatism, the different preparations of salicylic acid.

Chronic Inflammation of the Lachrymal Sac.

WHEN the mucous lining of the nasal duct gets thickened and obstructed, the patient complains of great weakness of the eye, which is constantly *weeping*,—the nostril on the same side having a corresponding *dryness*. The tears not passing down through the obstructed duct, collect in the lachrymal sac, and form a small tumor by the side of the nose. By pressing the finger upon this, the tears may be squeezed out through the upward passage, and glairy mucus along with them. There is generally tenderness of the sac, and sometimes redness of the skin. There is commonly inflammation of the mucous membrane lining the eyelids, etc.

Treatment.—The acute inflammation of the sac must be treated by purgatives and cold washes.

Chronic inflammation of the sac requires a special attention to the general health. The diet should be carefully regulated, and the alkaline sponge-bath used every day, with brisk rubbing after it. When the sac gets very full, the patient should try gently to force the contents *down* into the nose by pressing upon the upper side of the tumor • and he may promote the same object by strongly drawing in his breath often with his mouth and nostrils both tightly shut. The so-called citrine ointment, full strength, may be applied to the eyelids at bed-time, and a little of prescription (211) may be dropped once during the day into the inner corner of the eye.

Purulent Ophthalmia. — *Egyptian Ophthalmia.*

OWING to the glaring sunshine, and the particles of sand with which the air is loaded, this disease is endemic in Egypt. Hence its name *Egyptian ophthalmia*.

Symptoms. — It begins with stiffness, itching, and watering of the eyes, and a feeling as if there were dust in them. The lids are a little swelled, and become glued together during sleep. The mucous membrane which lines the lids and covers the ball is intensely red and swollen, and discharges a copious quantity of pus. There is a severe burning pain extending to the cheek and temple, with headache and fever. The eyes cannot be opened. It is both contagious and infectious.

Treatment. — At the very beginning, apply a nitrate of silver wash (211) twice a day. With this application, a low diet, and five to ten-drop doses of fluid extract or tincture of veratrum viride, every hour, this terrible complaint may often be broken up.

If the disease have reached its height, and there is great fever and headache, the patient may be freely purged (31), and the pain be allayed by cocaine applied with a camel's hair brush.

The patient must be kept in bed, in a dark room, with the head elevated.

The eyes should be frequently washed out gently with warm water, or a decoction of poppies, containing one grain of alum to an ounce. This must be done with a piece of fine sponge, or with a small syringe. Once or twice a day, a few drops of solution of nitrate of silver, two grains to the ounce of soft water, may be dropped in the eyes from a camel's-hair pencil. As soon as the disease begins to give way, the alum in the poppy decoction may be increased a little.

Purulent Ophthalmia of Children.

THIS always begins within a short time after birth, — generally on the third day.

Symptoms. — The edges of the lids at first become red, and glued together, and the membrane lining them is red and rough. The eye

remains closed. The conjunctiva or membrane which covers the globe, next becomes intensely scarlet, and so much swelled, at times, that the lids turn out; and it discharges a thick purulent matter. The child is feverish and restless.

Causes. — Exposure to cold and damp, bad nursing, omitting to wash away from the eyes the cheesy secretions of the skin, and the contact of gonorrhœal and leucorrhœal secretions of the vagina at birth.

Treatment. — Wash out the eye frequently, and gently, with a weak astringent wash (207), (203), or put between the lids once a day, a large drop, with a camel's-hair pencil, of a solution of nitrate of silver, 4 grains, water 2 ounces. When the disease is declining, apply to the lids, with a camel's-hair pencil, the ordinary citrine ointment of the druggist.

Catarrhal Ophthalmia.

Symptoms. — In this complaint, *the white of the eye* becomes inflamed and very red, the redness being superficial, so that the vessel can be moved by pulling the eyelids; generally there is a thin mucous discharge, which, in severe cases, becomes thick and purulent. It is caused by cold and damp.

Treatment. — If there be considerable pain and headache, give purgatives (31), (19), and continue them, once a day, till the symptoms of active inflammation subside. Apply to the eyes a poultice of slippery elm, and bathe them frequently with a decoction of poppy leaves, lukewarm or cold, according to the choice of the patient. Smear the edges of the lids at night with fresh lard; and when the inflammation begins to decline, use diluted nitrate of mercury ointment instead. Keep the eyes well protected from the light with a shade. A large drop of a solution of nitrate of silver, two to four grains to the ounce of water, may be put into the eye two or three times a day. Sometimes sulphate of zinc, four grains to the ounce of water, will do well, or cocaine solution, 4 per cent.

When the disease reaches the chronic stage, — the pain and headache having passed off, — some astringent applications will be required, as a very *weak* solution of nitrate of silver (208), or a dram each of powdered witchhazel leaves and golden seal, steeped for ten minutes in a gill of boiling water, and strained when cold.

Scrofulous Ophthalmia.

THIS disease is chiefly confined to children under eight years of age.

Symptoms. — Entire inability to bear light; the lids are spasmodically closed, and the head constantly turned away from the light. The blood-vessels of the conjunctiva are not particularly injected.

with the exception of one or two large ones which run towards the cornea, and terminate in one or more small opaque pimples. The cornea frequently ulcerates, and the complaint is very obstinate, — being liable often to recur.

Treatment. — As in all serofulous complaints, it is important in this to look after the general health. No more physic is required than to keep the bowels open; and even this, if costiveness exist, had better be done by bread made from unbolted wheat flour, by injections of cool or tepid water, and by exercise. The health must be supported by iron, sarsaparilla, stillingia, and quinine.

The eye is to be strengthened by cold water applied to the lids, the forehead, and the temples. The eyes may be bathed likewise with a warm decoction of poppies, or of chamomile flowers or cocaine.

But one of the best applications is a solution of nitrate of silver, one or two grains to the ounce of water, a few drops being put into the eye once or twice a day. Occasionally a solution of sulphate of copper, of the same strength, may be used with decided advantage.

Both eyes should be protected by a shade.

Inflammation of the Cornea. — *Corneitis.*

Symptoms. — The cornea is rough, red, opaque, and generally prominent. There is some pain and inability to bear light, but not great. The pulse is frequent, and the skin dry.

Treatment. — If the inflammation be acute, use heat, purgatives and tincture of veratrum. Apply fomentations and smear belladonna ointment on the eyebrows.

For the chronic form give quinine and other bitters. The wine of opium, and the diluted nitrate of mercury ointment, must be applied to the lids, or cocaine.

Inflammation of the Iris. — *Iritis.*

THE iris is covered with a serous membrane, and is very liable to adhesive inflammation.

Symptoms. — In the first stage, the iris changes its color, and the pupil is contracted. In the next stage, lymph is poured out upon the surface in a thin layer, sometimes, which looks rusty, and sometimes in larger quantities, filling the whole cavity of the aqueous humor.

Causes. — Injuries, or overworking the eye, but more frequently a taint of the system from gout or syphilis.

Treatment. — If there be considerable inflammation, protect the eyes from the light and keep down the circulation by tincture of vera-

trum. To relieve pain, use continuously either hot or cold water applied on cloths, whichever is agreeable to the patient; these cloths must be changed frequently enough to keep the parts at an even temperature. The strength is generally to be supported by quinine; and in many instances, iodide of potassium is to be given as an alterative. A little solution of atropia, one grain to the ounce of water, is to be dropped into the eye once or twice a day, and the bowels to be kept open by gentle physic. In severe pain give morphia one-sixth of a grain by mouth.

Weakness of Sight. — *Muscae Volitantes*.

THIS is an affection to which persons of weakly constitution are liable, and those who write much, or examine very small objects.

Symptoms. — Dimness of sight; uneasiness on exposure to a strong light; and specks floating before the eyes, — often looking like flies.

Treatment. — The complaint depends on debility, natural or acquired; and tonics, as quinine and iron, and the shower or sponge bath, and out-door exercise, are the proper remedies.

Imperfect Vision. — *Amaurosis*.

THE complaint here referred to is dependent on some change in the optic nerve or the brain, — most commonly the former.

Symptoms. — In some cases the sight becomes suddenly dim, and is perhaps soon lost altogether; but more often it is impaired by slow degrees, — being only defective at intervals, as when the stomach is out of order, or the eyes have been fatigued. At one time, it will begin with objects appearing dim; at another, with their being double; at still another, with the ability to see only one half of objects. In some instances, the complaint begins with a crooked or disfigured or discolored appearance of things looked at. Again it will begin as near-sightedness, or far-sightedness; or the patient cannot measure distances, and will miss his aim in pouring water into a glass, or in putting a match to the wick of a lamp. The flame of a lamp will appear split. At times the eye does not bear light; at other times it longs for it, and objects do not appear illuminated enough.

Distinction. — Amaurosis may be distinguished from cataract by there being no opaque body to be seen behind the pupil; and by the light of a candle appearing discolored, split, or lengthened, or iridescent; whereas in cataract vision is only clouded, and a lighted candle looks as if surrounded with a mist.

Chances of Cure. — These are generally not very favorable, unless the remedies employed very soon produce good effects.

Treatment.—Electro-galvanism is one of the most promising remedies. Bayberry root, dried and reduced to an impalpable powder, and taken as a snuff, is occasionally useful. Cayenne, steeped in water, one grain to one ounce of water, and a little of it dropped into the eye, may stimulate the palsied nerve, and in some cases restore sight.

But probably nothing will do better than cold bathing,—a shower bath if it can be borne,—out-door exercise vigorously pursued, and an adherence for a long time—perhaps a year—to a strictly vegetable diet, at the same time using nervine tonics, etc. (316).

Short and Long Sight.

Short Sight, called *myopia*, depends on *too great a convexity of the cornea*, or crystalline lens, or vitreous humor,—one or all,—and the consequent formation of the image of the object inspected *a little in front of the optic nerve, or retina*,—as at *a* (Fig. 183), instead of at *b*.



FIG. 183.

where it should be formed. The rays of light are brought to a focus before they reach the retina.

Children are either born with this defect, or it is brought on by too close study, or by long application of the eyes to minute objects.

It may be remedied frequently by exercising the eyes in looking at distant objects. Children afflicted in this way should have their studies abridged, and their exercise in the open air increased. While studying they should have some apparatus applied to them which shall keep the chin elevated, so that the head cannot be dropped too low, and the eyes brought too near the book. And the book should each day be placed a very little further from the eyes.

Glasses worn by persons having this defect of vision should be concave, as at *c*.

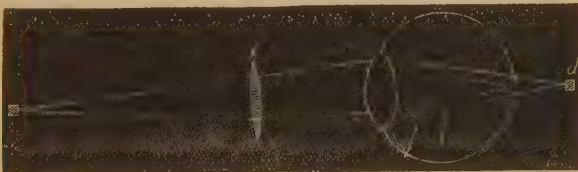


FIG. 184.

Long Sight, or *presbyopia*, depends on the humors of the eye *not being convex enough*. In this case, the image of the inspected object is formed *beyond the optic nerve*, as at *d* (Fig. 184). This is one of the earliest signs of advancing age.

This defect is to be remedied by glasses which are *convex*, *e*. Persons in the early autumn of life must not resort to glasses too hastily, or, indeed, until they are compelled to, nor should they change those first used too soon. Glasses should make objects look distinct and bright, but not larger than natural.

Squinting.—*Strabismus*.

IN strabismus, the eyes are not parallel in their position and motion.

It is supposed that one eye may become weaker than the other, or that the visual axis of the two may not be adjusted alike, so that one eye—perhaps the more defective one—turns aside to escape the distorted vision, or possibly the injury to itself which would follow the attempt to make eyes of unequal power work evenly together. The opposing muscles lose their counterbalancing force, and the internal rectus, gaining the preponderance, draws the eye *inward*,—for the squint is more often *convergent* than *divergent*; that is, the eye turns *in* more often than *out*. Both eyes sometimes squint.

Treatment.—In recent cases there is some chance of curing this complaint without a surgical operation. The patient should not be in the society of other squinting persons, so as to learn it by imitation.

In the first place care should be taken that the bowels are kept in good condition, and that the general health is well fortified by bathing, tonics, and exercise. The patient should be made to stand before a glass, and while he closes the sound eye, look steadily at some object with the squinting eye. Let him do this till the eye is a little tired; then let him open the sound eye, when the squinting one will turn aside. But by compelling it, in this way, several times a day, to work in a straight line, it may, perhaps, be taught to remain parallel with the other.

Nervine tonics, as strychnine (86), (94), (95), (316), will sometimes do good service; and electro-galvanism has been found useful in many cases.

But in old and obstinate cases, the only cure is found in dividing the muscle which pulls the eye to one side,—the internal rectus, if the eye is drawn in,—the external rectus, if it is drawn out.

Affections of the Ear.

THESE are so common, that, in almost every family, they require attention, at one time or another. And deafness, which so often results from these disorders, is so serious a misfortune that every affection of the ear should receive early attention.

MUSCLES of the EYE

- A Optic Nerve
- B Oculo Motory nerve moves 5 muscles of eye.

C
D
E



- F Internal Rectur (Muscle)
- G External Rectur (Muscle)
- H Oblique Muscle

NOSE and NASAL CAVITIES

A Nasal bones



ORGAN of HEARING

- A External Ear.
- B Canal through which sound passes to the ear drum.
- C Ear Drum.
- D Temporal Bone



- E Middle Ear Cavity
- F Eustachian Tube which passes into throat
- G Auditory Nerve
- H Part of inner ear

- ## UNDER SURFACE of TONGUE
- A Bone to which tongue is attached
 - BB Muscles to draw tongue backward.



- CC Temporal Bone
- D Hypo Glossal Nerve
- E Lingual Nerve
- F Glands of Tongue

Examination of the Meatus.— For examining the meatus, or external passage of the ear, there is perhaps no better instrument than a simple silver or glass tube, of the size and shape represented in Fig. 185.



FIG. 185.

To make the examination properly, place the patient either in a sitting, kneeling, or standing posture, as may be most convenient, with the ear directly under a good stream of gas- or lamp- or sun-light. Then take hold of the ear with the thumb and finger, and gently draw it outward and backward, and with the other hand introduce the small end of the tube or speculum, and carry it forward as far as it will go without producing pain. Then by gently swaying the large end of the tube back and forth, a stream of light may be made to illuminate all sides of the passage. If the lining of this passage is smooth, dry, pearly-white, and shining, and is without wax, it may be regarded as healthy. At the close of the passage, the tympanum may be seen, and should be semi-transparent, dry, and grayish-white. Within this may be seen the handle of the malleus, coming from above downward and forward. This bone runs about half way across the tympanum, and divides it into an upper front, and a lower back part. This lower back portion, when viewed through the speculum, is more glistening than the upper and front part, and a bright spot of light is seen on its most rounded portion, which is just below and behind the point of the malleus. Inflammation causes this innermost part of the meatus to become thickened, vascular, or granular,— like the conjunctiva of the eye when it is inflamed; it also causes it to secrete and discharge matter.

Inflammation of the Meatus.—*Otorrhœa.*

THIS is quite a common complaint among delicate children; and may occur as the result of scarlet fever, or be excited by currents of cold air, by rotten teeth, or by deranged stomach and bowels.

Symptoms.— Fever, headache, intense pain in the ear, and swelling of the glands of the neck. After a time, a reddish, watery discharge comes on, which soon grows thicker and mattery. The fever disappears with the appearance of the thick matter. An examination with the speculum shows the whole meatus to be swollen, vascular, and covered with a slimy matter.

Unless great attention be given to cleanliness, the discharge becomes very abundant and fetid, and lasts for a long time; and if neglected, will be likely to lead to very serious consequences, even the decay of some of the bones of the head.

Treatment.— While the inflammation is acute, and there is fever and pain, the diet should be confined to mere liquids,— as rice-water,

gruel, etc., and the bowels should be opened with some preparation of salts, the ear being gently syringed, occasionally, with warm water or decoction of poppies, and being covered with a warm poultice of flax-seed or bread and milk. In place of a poultice, a soft linen bag filled with bran, and dipped in hot water, may be kept on the ear.

The pain and fever being gone, and the *mattery* discharge having come on, the case is to be treated like other *chronic* diseases of mucous membranes in scrofulous constitutions, by tonics, alteratives, warm baths, and out-door exercise.

The ear may now be gently syringed out with castile soap and water, and immediately after with a weak solution of alum, or sulphate of zinc, one grain to a dram. This may be done twice a day. Or, a little of a mixture of two drams of solution of sugar of lead and half a pint of water may be dropped into the meatus, and, after remaining two or three minutes, be allowed to run out. If the discharge be very fetid, two drams of solution of chloride of lime, with half a pint of water, will make a suitable wash with which to syringe it, applying, once a day, a solution of tincture of iodine 1 dram to the ounce of water.

Should the discharge stop at any time, and pain and fever come on, lay aside these astringent applications, and go back at once to the leeches, purgatives, poultices and fomentations.

Wax in the Ear.

THE ear sometimes becomes completely filled with wax, mixed with hairs and flakes of scarf-skin, impeding greatly the sense of hearing.

Treatment.— Let the ear be gently syringed each morning with warm soapsuds, so as to thoroughly clear out the whole mass of matter, having dropped into the ear the night before four or five drops of oil. The water may be quite warm, and a little cotton should be loosely inserted after the syringing.

Earache.—*Otalgia*.

Symptoms.— This is simply *neuralgia* of the ear, and comes on in fits of excruciating pain, which shoots over the head and face. It may be distinguished from inflammation of the ear by the suddenness and intensity of the pain; by its not throbbing, not increasing in intensity, not being attended by fever, and not coming and going without apparent cause.

Treatment.— Fill or remove all rotten teeth, which may be suspected as the cause of the suffering. Give iron, particularly the citrate combined with strychnine (316).

Any hot application will be found to relieve this painful affection without resort to the use of articles more or less dirty that were formerly used. A hot water bottle, hot salt bags, hops steeped in hot water and placed in a bag, or syringing out the ear with very hot water for ten or fifteen minutes will many times give relief. Heating a small quantity of equal parts of olive oil and laudanum in an iron spoon and pouring two or three drops into the ear, then covering by cotton, is a good remedy.

Inflammation of the Tympanum.—Deafness.

Otitis.

Symptoms.— In the acute form of the disease, there is violent pain, ringing noises in the ear, and delirium. When the suppuration takes place, there is a chill, and a heavy, tensive pain.

In the chronic form of the complaint, the lining membrane of the tympanic cavity has its vessels a little enlarged, with blood sometimes effused into its substance, or lymph upon its surface, or the membrane is thickened, and sometimes covered with tuberculous concretions, or there are fibrous bands occupying nearly the whole of the cavity.

Symptoms.— These are slight,— the first perceptible change being generally *deafness* in one or both ears. There may be a woolly sensation, with noises or ringing, and slight aching pains.

Treatment.— As the deafness in these cases generally depends on a *chronic* inflammation of the tympanic membrane, the best remedies are those which improve the condition of the digestive organs and general health, as regular diet, bathing, pure air, and exercise, with tonics and alteratives.

If the inflammation be acute, it must be combatted with purging blisters, poultices and fomentations.

When deafness is caused by inflammation in the Eustachian tubes, or from enlargement of the tonsils, etc., the tonsils must be cut off, and a solution of nitrate of silver, twenty grains to the ounce, must be thrown upon the mouths of the tubes with a shower syringe.

As deafness when due to throat troubles is caused by disturbance of air pressure in the middle ear on account of the eustachian tubes being closed, the object is to make them permeable to air. The Politzer air bag is the best method to accomplish this and consists of a large bulb attached to a rubber pipe which has a small rubber nozzle at the end to insert into the nostrils. The patient holds a swallow of water in the mouth until the operator has placed the rubber

nozzle in the one nostril, and tightly closing the other nostril, he presses the bulb. At the time when the air is forced into the nose, the patient is told to swallow. The action of swallowing causes the throat muscles to close in such a way that the only escape for the air is through the tubes and this is what it was hoped would be accomplished. Another fairly successful method to obtain the same result is named the Valsavaan, after the ear specialist who originated it. This consists in closing both nostrils between the thumb and forefinger and then closing the mouth, forcibly trying to blow the nose. As air cannot escape from the nostrils because they are being held, many times it will go through the tubes.

Bleeding from the Nose.—*Epistaxis*.

Treatment.—In full-blooded persons, with redness of face, and subject to headache and dizziness, bleeding from the nose may be salutary, and necessary to ward off apoplexy, and should not be too suddenly stopped.

When the bleeding is such as to require to have it arrested, plug the nostrils with the scraping from a fur hat, or with lint, dipped in a strong solution of alum or tannin or Monsel's persalt of iron, one part to ten parts of water. To give immediate relief, press up under the upper lips or apply something cold to the back of the neck.

Ingrowing Toe=Nail.

To most persons, the above words will suggest some unpleasant associations, for there are few but have had some painful experience with this affection. It is usually, like corns and some other troublesome things, the penalty inflicted for wearing tight shoes. It generally appears upon the great toe. The constant pressure of a narrow boot or shoe against the side of the toe, causes the edge of the nail to sink into the flesh, producing inflammation and pain, and finally ulceration. Nature, attempting to repair the mischief, sends out granulations, which, being perpetually irritated, shoot up into unhealthy growths, called *proud flesh*. Thenceforward, the sufferings of the patient become incessant; and he cannot now even compromise, as he would be glad to do, by putting on shoes of ample dimensions, but is obliged to negotiate a peace by putting away the shoe altogether, or by cutting a hole through it to take off the pressure. At the risk of giving the reader a few dismal twinges every time he looks upon this page, we place here, in Fig. 186, a good representation of this tormenting disorder, as a suitable warning against the folly of giving the toes narrow quarters.



FIG. 186

Treatment.

When the disorder begins to make its appearance, it is a good plan to scrape the nail very thin on top; this will cause it to grow upon the upper surface, and to give way at the tender part, so as to obviate, sometimes, the necessity of any other treatment.

The following is the best treatment. Wash the toe in warm water, and make the parts dry with cotton wool. Then gently press cotton wool in between the toe-nail and the tender projecting flesh, and extend it along the groove back between the skin and nail. Next, wet the end of a piece of nitrate of silver, and rub it thoroughly upon the nail, close to the cotton, not allowing it to touch the tender flesh; then put on a thin layer of cotton wool, and, in two or three hours, a poultice around the toe.

In two days, the nail will be perfectly black, and, as far as the nitrate was well applied, will be separated from the parts underneath and may be taken off without pain.

If the nail is *very thick*, scrape off the black and deadened part in two days, and apply the nitrate again. This treatment is a vast improvement on the old and cruel practice of tearing off the live nail.

Chafing and Excoriation.

WHEN the neck, arm-pits, thighs, etc., of children, get chafed or excoriated, a remedy may be found by keeping the parts clean, and by dusting them with powdered slippery elm, starch or talcum powder. If this does not effect a cure, apply Turner's cerate, or wash the parts with a solution of sulphate of zinc, or nitrate of silver, five grains to the ounce of soft water.

Grown persons may treat these troubles very much in the same way, or by wearing cotton between the parts which rub together.

Foreign Substances in the Nose.

WHEN any foreign substance gets lodged in the nose, close the mouth and the opposite nostril, and then blow forcibly through the obstructed side. If this is not successful, press the thumb against the nose *above* the obstructing body, and then make a hook of a piece of wire or knitting needle, and pressing it up over the offending substance, pull it down.

Foreign Substances in the Ear.

If flies and other insects get into the ear, fill the ear with sweet oil, and then syringe it out with warm water. Sometimes it will be sufficient to hold the head down on one side, and have the ear filled with water,—remaining quiet in this position for a short time, when the insect will rise to the surface. If any hard substance be got into the ear, lie down quietly upon the affected side, and send for a physician.

Foreign Substances in the Gullet.

If the substance have not gone beyond the reach of the thumb and finger, thrust them down as far as possible, and try to pull it out; or, a small curved pair of forceps will reach still lower than the fingers. Or, this failing, let some one place one hand firmly on the chest of the choking person, and give him a smart blow or two between the shoulders with the other hand. If the substance be down some way in the gullet, it may be pushed along into the stomach by some smooth, blunt instrument.

Foreign Bodies in the Windpipe.

SOMETIMES foreign bodies will remain a long time in the windpipe, and will only create some inflammation and cough, but not any immediately dangerous symptoms. When the body has gone entirely below the epiglottis, but little can be done, except to give a pinch of snuff to cause sneezing, and to direct the patient to expel the air explosively from the lungs by a few energetic and sudden coughs. This may drive the offending body out.

Bleeding from Wounds.

If bleeding occur from any part where a bone lies near the surface, as the head or face, it may generally be stopped by pressing firmly against the bone with a finger, or a piece of cork, or by binding on tightly a hard pad. If this does not succeed, lift up each edge of the wound, and examine carefully to see if any small stream of blood is *spouting out in jets*. If so, an artery is wounded, and the point of small forceps or tweezers must be dipped in where the jets come from; the spouting mouth taken hold of and drawn out; and a strong silk thread passed around it, and tied below the forceps. The white and gaping mouth of the vessel may then be seen.

If the bleeding be profuse from an arm, the whole current of blood to that limb must be cut off, which may be done by some person pressing a thumb firmly into the neck behind the middle of the collar-bone. This will dam up the blood in the great artery of the arm, as it comes out of the chest. The handle of a door-key, wrapped in several folds of linen, may be pressed upon this place for a long time until medical assistance can be had.

Dangerous bleeding from the thigh or leg may often be stopped by pressing the great artery just below the crease of the groin.

If the bleeding be below the middle of the upper arm, or middle of the thigh, pass a handkerchief once or twice around the limb, as far above the wound as possible, and tie it tightly. Slip a stiff stick under this, and turn it round, like the handle of an auger, until the handkerchief becomes so tight as to stop the bleeding. This arrangement is called a stick-tourniquet, and is intended to answer the same purpose as the instrument represented by Fig. 155.

One of the best methods now in use, of arresting hemorrhage in cases of accidental injuries of the large arteries of the extremities, is by surrounding the limb above with two turns of a piece of rubber tubing about three-fourths of an inch in diameter, and tying it tight. This safely and effectually controls all bleeding.

Advantage is taken of this elastic property of rubber in controlling hemorrhage, in performing what is called bloodless operations of surgery. It is called Esmarch's method, from the name of the originator. It may be resorted to in all operations on the extremities, whether of amputations, the removal of tumors, or in the minor operations of removing needles, and whenever the bleeding interferes with the performance of the operation.

It is applied as follows: The limb should first be tightly bandaged with an elastic rubber bandage about three inches wide, from below upwards, and then surrounded at the highest point with a band or tube of rubber in the place of a tourniquet. The bandage is then to be removed, when the operation may be performed in temporarily bloodless tissues.

An amputation of the thigh may be thus performed without loss of any blood of consequence.

Proud Flesh.

Proud flesh is a fungus growth or excessive granulation which occurs in a wound. It may be seen when nature repairs the wound so rapidly that the inside or muscle tissue heals faster than the outside or skin does. Occasionally the use of too stimulating applications will cause the same result.

Treatment.—The treatment consists in using the solid stick of silver nitrate which cauterizes the growth and healing then takes place, leaving a scar but not an excrescence.

Ambrine.

We can thank the European war for the fact that hereafter those who are scalded or burned may escape much suffering and certainty of terrible scars. Ambrine, invented by Dr. Barthe de Sandfort, is a wax made of resin mixed with paraffin. When melted at a high temperature and applied directly to the wound either with a soft brush or by means of a spray this wax forms an air-tight coating which instantly dulls the pain and prevents contagion. Protected by this coating nature unhindered at once starts rebuilding the charred tissues and in a surprisingly short time comparatively the parts are restored without a blemish.

It is possible at present to procure many preparations of a similar nature and of probably equal efficacy. The main point in the treatment of scalds and burns by this method is to be sure that the surface of the wound is absolutely clean before the remedy is applied.

COMPRESSION OF ARTERIES, TO STOP THE FLOW OF BLOOD.

COMPRESSION of arteries may be done by direct pressure of thumb or finger, or some object such as a key or piece of wood answering the same purpose. Better still, in places where it may be used is the tourniquet which is the name given the appliance whether made of a piece of string or more elaborately made of rubber or manufactured webbing (see Figure A). The object is to shut off the supply of blood from the heart and the point chosen is nearest the surface where compression may be applied and as far from the heart as possible.

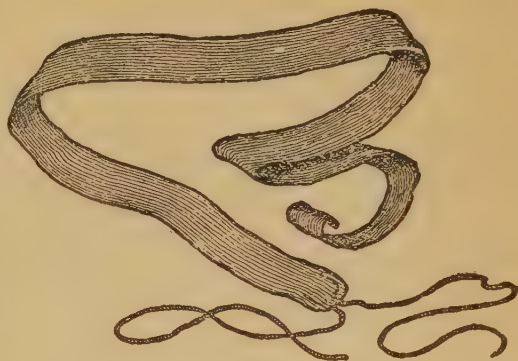
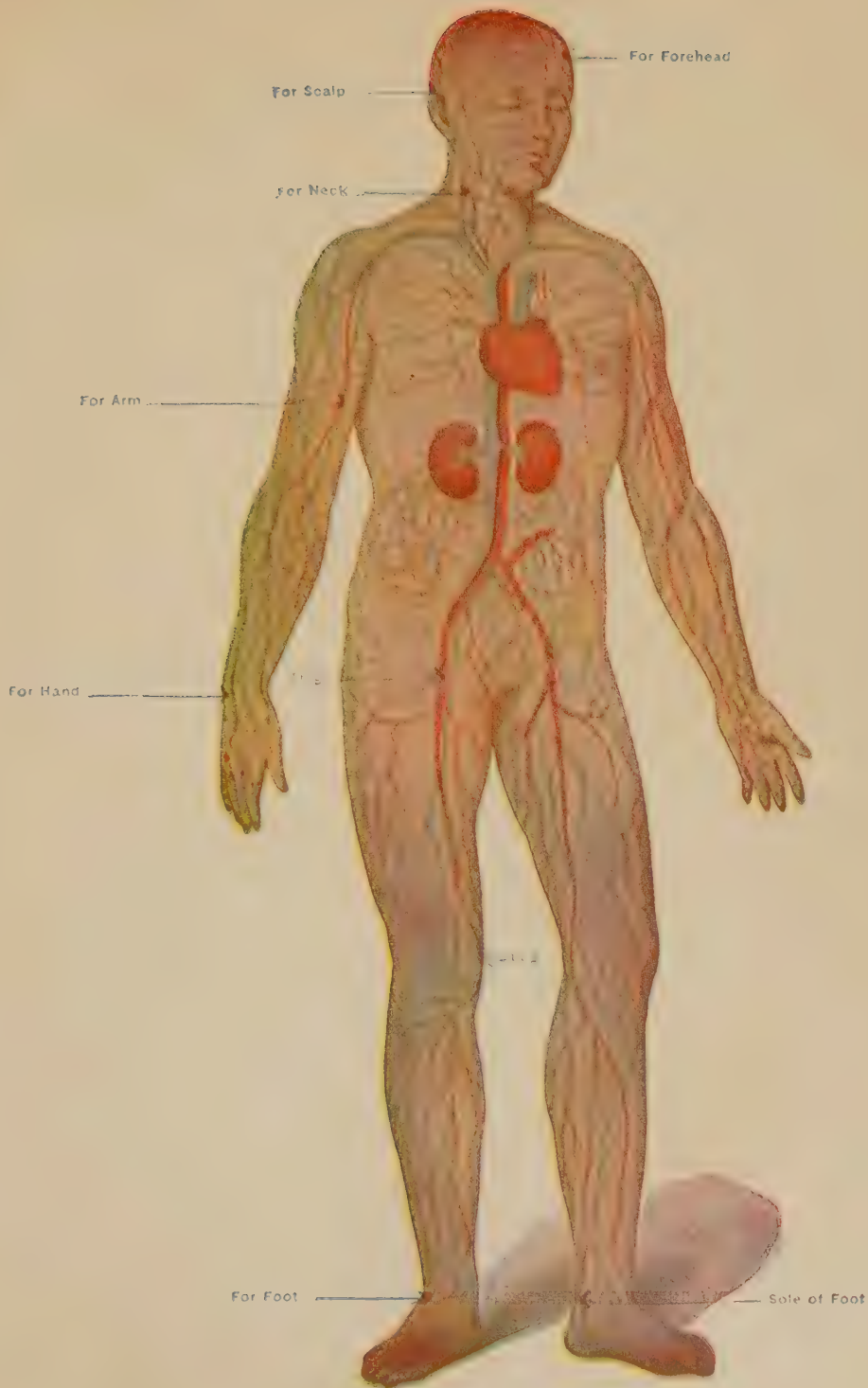


Figure A.



Figure B. Compression of Temporal Artery. Figure C. Compression of Subclavian Artery with key handle.



THE ARTERIES AND VEINS OF THE HUMAN BODY.
HOW TO STOP BLEEDING

The temporal artery may be felt and secured just in front of the upper inner attachment of the ear to the head (see Figure B).

The sub-clavian artery, just above the collar bone along the outer half before it is attached to the shoulder blade as in Figure C.

The brachial artery, at the middle of the upper arm at the under side of the biceps muscle

The ulnar artery, out of the front of the wrist just inside the ulnar bone, which is the one on the little finger side (palm upwards).

The radial pulse, the most accessible vessel in the body, is on the

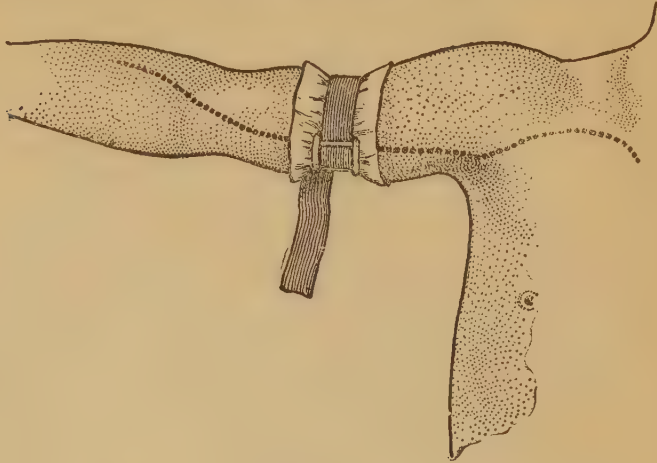


Figure E.

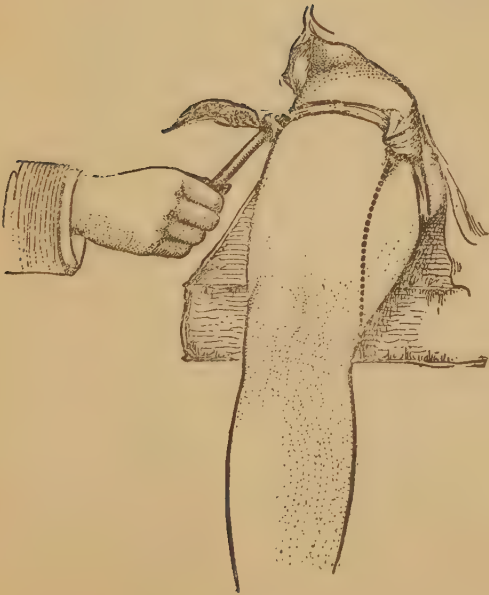


Figure D.

outer or radial or thumb side of the wrist between the prominent muscle tendon and the radial bone.

The femoral is at the extreme upper inner corner of the thigh.

The popliteal is at the under surface of the bend of the knee.

Figures D, E, F, G and H show different kinds of tourniquets and how used; figure D, for example, shows a tourniquet made by folding a handkerchief and tying it into a knot, the knot being placed over the artery, the handkerchief tied around the limb and then twisted as in cut. This presses the knot against the artery and stops the flow of blood. Figure E shows the band tourniquet; F the screw tourniquet applied; G and H show the improvised tourniquet applied to the arm or thigh.

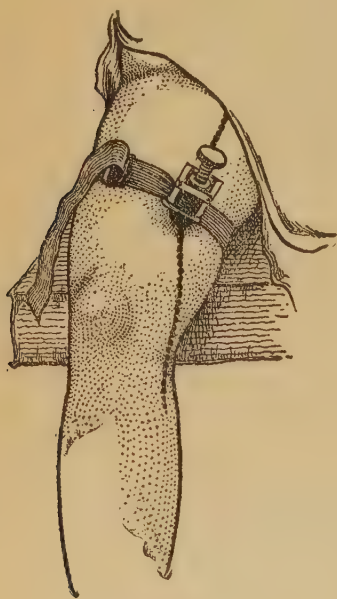


Figure F.



Figure G.

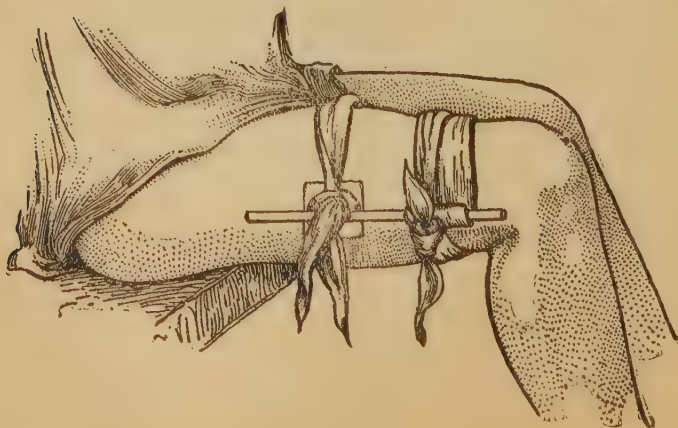


Figure H.

Anæsthetics.

IN these days when so much wonderful surgery is done and when everybody desires to have the advantage of all modern methods being employed in the treatment of their case, a little knowledge of anæsthesia will be of service to the reader. Before the discovery of ether an operation meant torture to the patient. If you should visit some of the old operating-rooms you would find rings in the floor to which ropes used to be attached in order to hold down the patient. Ether is the most commonly employed anæsthetic, and is safe to inhale, sure in its action and gives the least mortality. Something like one person in 50,000 dies from the inhalation of ether against one in 15,000 to 30,000 when inhaling other anæsthetics. It is not over pleasant to inhale, as it is somewhat pungent and choky to breathe when first inhaled. This sensation soon passes off. A longer time is required to produce anæsthesia with ether than with chloroform, but its greater safety overbalances this slight disadvantage. Vomiting more frequently occurs after ether than after chloroform.

Chloroform is the next most commonly employed anæsthetic. It is agreeable, quick in its action, and very little is required. It is the common anæsthetic in European practice, yet its greater mortality, the sudden change in heart and lung action, render its usefulness much more limited in this country than that of ether. It is employed especially in cases complicated by lung and kidney disease in the young and very old.

The *A. C. E.* mixture, so-called, is still a third anæsthetic, and is composed of a mixture of alcohol, chloroform and ether, and is frequently given to start a case with, as its inhalation is pleasant and its anæsthetic properties quick. Its mortality rate lies between that of ether and chloroform. Some people take these anæsthetics with perfect comfort; others, being timid, require a larger amount and give in to its soporific effects very slowly.

Of late *Cocaine* has been introduced into medical practice as a means of rendering the flesh numb and painless when injected under the skin about the site of the part to be operated on. It has the great advantage of maintaining the senses other than that of sensation and pain perfectly intact. By its use large operations may be done, and, in the case of minor operations, time and money are saved and bad after-effects are avoided. Sometimes a temporary faintness occurs from the use of a too strong solution, but this can always be avoided by weaker solutions and overcome at the time by a little stimulant.

For many local operations requiring incisions in the skin, temporary anæsthesia can be obtained by spraying the skin with a mixture of chloride ethyl. This acts by rapid evaporation in a way to freeze the skin, not enough to impair the tissue but sufficient to allow rapid operating for two or three minutes duration.

There is a popular feeling that ether and chloroform leave their traces in the system for a long time afterward; such is not the case, however, and fear need never be entertained that the system will be left the weaker for it.

In the use of anæsthetics proper, certain rules are to be observed. Nothing solid is to be eaten for a number of hours previous to the inhalation. All artificial teeth must be removed and all waist-bands and tight clothing should be loosened if not removed.

A little strong coffee or a little brandy and hot water may be given by mouth to prevent the subsequent vomiting and nausea.

Care of the Teeth.

DECAY and loss of the teeth is common even among the young. Few persons at the age of twenty have sound teeth, and the tendency to decay is no doubt to some extent inherited; but with careful attention they may be preserved in good condition till late in life. Parents should inculcate in their children the habit of cleanliness of the teeth.

Rotting of the Teeth.—*Caries.*

THIS is not confined to any age, temperament, or condition of society.

The teeth become diseased, die, and drop away, while all the other organs are sound and active.

The Creator doubtless intended that all the members of the same body should be equally durable; but certain laws of nature, violated by us habitually, turn upon us, as it were, in anger, and smite us full in the face, breaking our teeth, and robbing us of the means of preserving the health which we do not appear to prize.

When rotting begins in the teeth, its progress is more or less rapid, and their destruction is certain, unless it is arrested by artificial means.

The enamel is nature's fortification to protect the teeth against external injuries. When this is broken, or worn away, the bone of the tooth becomes exposed, and rotting begins immediately. Whatever has a tendency to crack, break up, or destroy the enamel, therefore, is to be carefully avoided.

Hot Drinks, or hot food, coming suddenly in contact with the enamel, are liable to crack it, and expose the bony substance of the tooth. The enamel is exceedingly brittle, much like glass in its structure, and is easily cracked when exposed to sudden transitions from heat to cold, and from cold to heat.

Luxurious Living often deranges the general health, and causes acid and unhealthy secretions in the mouth, which act injuriously upon the enamel.

Acids are injurious to the enamel; and when taken as medicine, should be well diluted, and in some cases, drunk through a tube, so as not to come in contact with the teeth. Sugar is not directly injurious to the teeth, as many suppose; but if allowed to remain about and between them, it may generate an acid which is destructive to the enamel.

A Crowded Condition of the teeth in the mouth causes the enamel to wear away, and leads to rotting; in which case, early attention and advice from a dentist is quite important.

Food Lodged Between the Teeth, and in their depressions, is a cause of extensive decay. Animal and vegetable matter, when exposed to warmth and moisture, soon generate an acid which corrodes the enamel. The teeth, consequently, often begin to decay in parts where one presses upon another, and in depressions, where food lodges and remains. This shows the necessity of cleansing the mouth and teeth often,—particularly after meals.

Mercury, when taken to the extent of salivation,—whether it be calomel, corrosive sublimate, blue pill, or any other form of it,—causes inflammation of the membranes about the teeth, and indirectly produces caries.

Acidity of the stomach, the contact of decaying teeth and dead stumps with sound ones, diseased and ulcerated gums, and, above all, a filthy, unclean and unwholesome condition of the mouth, are active causes of diseased teeth.

Improper Tooth-Powders, as those containing gritty particles, are to be avoided.

Tobacco, by deranging the general health, may be indirectly injurious to the teeth. Smoking blackens the teeth; and though chewing may be useful in deadening the sensibility of the nerve of a decaying tooth, this alone is not a sufficient reason for so uncleanly and disagreeable a habit, while so many agents may be found to produce the same effect.

Tartar.— This is derived from the saliva, and is found, when examined by the microscope, to be composed of myriads of living animals. When first deposited around the teeth, it is in a soft state; but, when not brushed away, it soon hardens, and changes from a yellow to a brown, and sometimes to a black color; and often in children it becomes a dark green. It destroys the beauty of the teeth, giving them a filthy and revolting look; the setting of the teeth in their sockets is weakened; their appearance is elongated; the periosteum or covering of the fang becomes inflamed and tender; and, if the proper remedy be not applied, the teeth will become loosened, and finally fall from their sockets. It causes the gums to become inflamed, swollen, tender, and ulcerated, and loads the breath

with a disagreeable fetor. Its *direct* influence on the teeth is not great; but it vitiates all the secretions of the mouth, and is thus a very efficient, though an indirect cause of decaying teeth. In all cases, it should be immediately and carefully removed, and some astringent wash, made from Peruvian or oak bark, be applied to reduce the inflammation and swelling of the gums.

Tooth-Ache.

THIS is generally caused by an exposure of the nerve which fills the internal cavity of the tooth. This exposure is caused by a fracture, or, more commonly, by the rotting away of a part of the tooth. This nerve is extremely sensitive; and, by coming in contact with the air and acrid substances, inflammation is excited, and tooth-ache is the consequence.

Teeth sometimes ache when they are, to all appearance, perfectly sound. This may be caused by bony enlargements of the ends of the fangs, inflammation of the periosteum, a peculiar irritability and ague of the face, which excite neuralgia, etc.

Pain of a sound tooth is sometimes caused by sympathy with a decaying one, by a disordered stomach, or by scurvy, pregnancy, tartar, or whatever excites painful sympathetic action in the nerves of the face.

Treatment.—Tooth-ache may be quieted by placing a drop of oil of cloves, or cajeput, or a drop of creosote upon a piece of cotton, and inserting it into the cavity of the tooth, and bringing it into contact with the exposed nerve. A few drops of a five per cent solution of cocaine placed in the tooth by means of absorbent cotton, or even wiped around the gum, acts very beneficially and usually quiets the worst tooth-ache. Chloroform likewise is often good.

Pains of the face and jaw, when not the consequence of rotten teeth, may be relieved by holding brandy, or whiskey, or rum, or diluted tincture of cayenne, or hot water, in the mouth, and by external applications of laudanum, Oliver's plaster, a mustard plaster, or hops steeped in alcohol, or apply a hop bag heated. But for teeth too much decayed to be saved by filling, there is no remedy so proper as extraction.

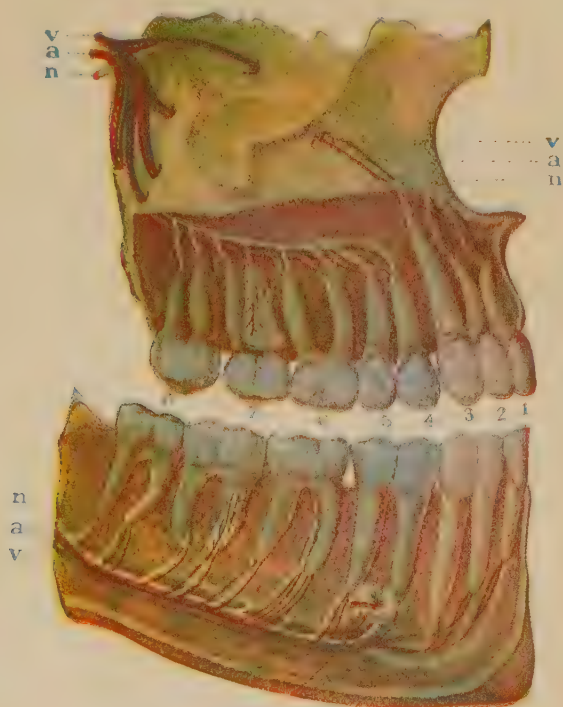
Filling Teeth.

THERE is no operation of the dentist of more real and lasting benefit to the patient than that of filling rotten teeth.

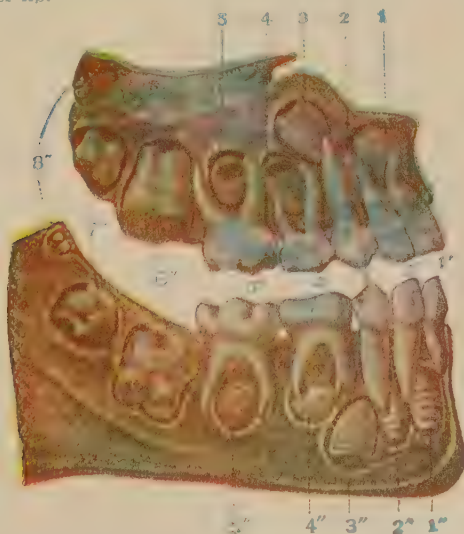
A tooth that is well filled before its nerve is exposed, is as serviceable as a sound one, and nearly as durable. Its preservation for many years is perfect and complete.

It is necessary, in the performance of this operation, to remove very carefully all rotten and foreign matter lodged in the cavity; to make the cavity of a dovetail shape, so as to retain the filling; to wipe

Teeth of the human being, the roots of which have been exposed to show the places where nerves and blood-vessels enter the teeth



No. 1 and 2 incisors of the right side. No. 3 eye-teeth. No. 4 and 5 molars (grinding-teeth). No. 6, 7, and 8 molars. *v* veins; *a* arteries; *n* nerves of teeth; *t* opening through which the branchings of these vessels, etc., pass to the lower lip.



First teeth of a child, the roots of which are exposed to show the undeveloped forms of the second teeth. The figures and their dotted connecting lines refer to the teeth of the same name (upper and lower) and the undeveloped formations of the second teeth.

it perfectly dry; and to press the gold in so as to make the cavity perfectly water and air tight. A tooth filled in this way may be preserved many years, and in many cases during life.

When decay has gone so far as to expose the nerve and render a tooth painful, the nerve, in all cases, should be destroyed before the cavity is filled; otherwise there may be soreness, and sometimes extreme pain making the extraction of the tooth absolutely necessary.

A tooth filled after the nerve is destroyed is not as good as if filled before the nerve was exposed; the walls of the cavity are thinner and weaker, and consequently are more liable to break and crumble away when brought into contact with hard substances; and the filling will be more likely to be loosened. There is likewise some danger of ulceration and absorption at the root of a tooth, when filled in this condition, which makes it very important that teeth should be filled early.

Gold foil is preferable to all other substances for filling teeth. If it is properly dressed and polished, it will remain in the mouth for many years without any sensible loss of its substance.

The First Teeth.

It is an imperative duty of parents to see that their children's teeth have early and careful attention.

The health and durability of the permanent teeth depend materially on the healthy condition, regularity and durability of the temporary ones. It may seem strange that diseases of the first set of teeth should influence the set which is to follow; but when we consider that the rudiments of the second set already exist when the first are cut, it is not unreasonable to suppose they may inherit disease from their predecessors.

Cleaning the Teeth.

THE most important rule to be observed in the preservation of the teeth is to keep them perfectly clean, and never to allow any foreign substance to remain on or about them. A decaying tooth should never be allowed to remain in the mouth; it causes others to decay.

If tartar has been allowed to collect, have it removed immediately. The teeth should be carefully and thoroughly brushed daily with warm water, and the occasional use of a dentifrice that is impalpably fine, and that contains no acid.

A **Brush** has no bad effect upon the teeth, as some suppose, for the parts of the teeth most exposed to the friction of a brush are never the first to begin to decay. This beginning of decay takes place in their depressed surfaces, and where they touch each other. A soft brush is better for the teeth than a stiff one, because the latter is apt to fret the gums, and cause them to recede, which gives the teeth a lengthened appearance.

Teeth in a crowded condition should never be filed, unless they begin to decay.

Tooth-Picks, made of quill, or wood, or ivory, should be used after meals, and all particles of food lodged between the teeth should be removed.

In Sickness, the rules for cleanliness of the teeth should be more rigidly enforced than at any other time, as then they are more exposed to destructive agents, and are liable to participate in the general debility and disease of the system.

Influence of Diseased Teeth upon the Health.

THE bad effects of a diseased and unclean mouth upon the general health are of more serious consequence than most people are aware. In twenty-four hours, we breathe twenty thousand times; and what must be the effect upon the delicate structure of the lungs, when, for days, months and years, the air we breathe is drawn through a depository of filth, and is poisoned by being mixed with effluvia arising from decayed and diseased matter in the mouth.

The intermittent fevers of the West are caused by the effluvia arising from the decaying matter of low grounds and marshes, which can hardly be more pernicious than the effluvia from the impurity and corruption generated in an unclean mouth, filled with decaying teeth. Dr. Hays says "no species of animal matter is so offensive to the health and vitality of the adjoining substance, whether nerve, or membrane, or any part or portion of the living body, as decaying bone."

Ulcer of the Stomach.

THE stomach is normally supplied with pure hydrochloric acid manufactured by glands in its mucous membrane. Should, for any reason, this acid become either too strong or too great in quantity, its action in addition to that of the food, would be on the stomach itself. In early or mild cases perhaps the trouble would be no more than that of a bad attack of indigestion or dyspepsia, but as the process continues, the pain becomes more severe and other symptoms follow which shows the severity of the trouble. If it is asked why the stomach walls are not thus digested if they are capable of absorbing the food that is being digested in it, the answer, while not satisfactory, is perhaps the best that can be given, that the vital forces which keep the tissue living, owing to constant circulation of blood, prevent the action of the juices upon the body. The ulcer of the stomach is fairly common, more so in England than in the United States, and is found most commonly between twenty and thirty years of age. Women are more affected than men and the occupation of servants, cooks, and waiters seem to increase cases. After some obscure dyspeptic symptoms, we have pain after eating with a constant gnawing when the stomach is empty, together with vomiting, many times of blood, and general failure of health with loss of flesh and strength. Food

when taken into the stomach seems to relieve the pain, which returns as soon as digestion has taken place and the stomach is empty again. The hemorrhage from the stomach is the true result of the erosion or eating away of a blood vessel in the ulcer, and this erosion may go so deep that perforation will be caused and a peritonitis will result. As partial healing of this ulcer may occur a cicatrix or scar in the stomach may be formed which will cause a contraction, which if occurring at the outlet will prevent food leaving the stomach as it should. Therefore, in addition to the distressing symptoms associated with gastric ulcer, we have as a consequence three serious additional possibilities: Death from hemorrhage or from peritonitis, due to perforation or inability of the food to leave the stomach on account of closing of the pylorus, which would cause excessive enlargement of the stomach and death by starvation.

Treatment.—Where competent surgeons are not obtainable, the treatment must be by medicine to counteract the excessive acidity. We give bicarbonate of soda in 10 to 15 grain doses several times a day, or any other simple alkaline. We are careful to have the diet consist of material that can be easily digested and not leave much residue to pass over the ulcer. Owing to the constant motion which the stomach and bowels perform in the endeavor to pass the food onward, the surface of the ulcers are being continually scraped by food passing over them. Healing is, therefore, retarded unless some method is devised to stop the irritation. The best treatment is by nutrient food thrown into the rectum by means of a syringe. Milk, eggs and digested juices can be absorbed by the rectum almost as well as by the stomach. Six ounces at a time may be used and this quantity given four times in twenty-four hours. With care and when given by a person practised in its use, larger amounts can be tolerated. The writer kept a young female patient for three weeks on nutrient feeding by the rectum, with complete recovery from extensive ulcer of the stomach, the only liquid that passed the lips being sips of water. Milk digested with peptonizing powders was used, a pint at a time, and the recovery from a bad ulcer which had caused so much loss of blood that the patient almost bled to death. An operation with brilliant results is now being done by surgeons. This operation goes under the title of gastro-enterostomy and consists in cutting off the small intestine where it leaves the stomach, especially if a constriction is present, but in any case a new opening is made in the stomach and the new portion of small intestines is sewed to this opening in the stomach. By this means, food is passed almost directly from the gullet across one end of the stomach into the small intestine and the remainder of the stomach is left in a state of rest. The operation has given great promise and in chronic cases is a well recognized procedure, especially after perforation.

Glanders.

THIS disease, while usually occurring in animals, especially the horse, is capable of infecting the human being by means of the transmission of its germs which is called *bacillus mallei*. Infection may occur through drinking water, from one horse to another, through the same trough, or to a man if careless about drinking, if the horse coughs or blows some of his nasal secretion into drinking cups. It can occur through wounds of the skin, but is most often contracted while taking care of the horse affected with the disease.

Symptoms.—Several days after beginning of infection, fever develops and the general sickness is felt throughout the body. A round, reddish painful nodule or swelling will appear in the nose or at the place where the skin is broken and ulceration of the lining of the nose with discharge of pus occurs. The rash composed of small boils or pustules which has an appearance like smallpox often shows upon the face, and within a week or ten days death occurs.

Treatment.—The treatment should be incision of all swellings, syringing with peroxide of hydrogen and the application of antiseptic washes. A remedy called mallein has been recommended, but recovery is very rare in spite of all we may do. We are warranted in taking all precautions to prevent friends and attendants from contracting the disease.

X-Ray.

THE Röntgen or x-rays are developed by means of a powerful current of electricity which is passed through a large glass tube from end to end rather than on an incandescent principle by which the current returns through the same aperture that it enters. These tubes have had the air withdrawn from them to the highest possible degree, in which respect they are like incandescent lamp globes. The x-ray tube is called a "Crookes" tube, named from the inventor. The discharge of electric current through the rarefied air in the tube allows the transmission of shadows through what was formerly an opaque or non-light-conducting substance. Professor Röntgen of Wurtzburg, Germany, is the man to whom the discovery belongs, though four or five years before his announcement, Hertz had shown that light waves were able to penetrate solid matter. In 1895 Röntgen accidentally discovered that a certain chemically prepared paper becomes phosphorescent when used in connection with a Crookes tube. From this date the development of the so-called x-ray has been rapid. It is well known that nails, screws, and other metallic substances may be imbedded in wood, and their exact location shown by means of the x-rays, but it is of interest to know what development the new science has made in medicine and surgery. We can discover where a bullet lies in a head or in an arm, whether in bone or in muscle or in the

regions where it is too dangerous to attempt to remove the foreign body and allow it to remain. Broken bones show up well under the influence of the x-rays and bad results after fracture may be determined and better ones obtained by resetting. Varieties of club-foot and flat-foot may be inspected and the operation necessary for their cure determined. In cases owing to too much swelling or pain where either fracture or a sprain may be present, we may determine with exactness which injury we have to deal with. Philadelphia surgeons lately were able to make out the exact spot at which a jack stone was located in a child's gullet, and its removal by the knife was accomplished.

As the detection of one substance from another depends upon the difference in density between two substances, it stands to reason that the greater difference there is the clearer the picture will come out. By means of the so-called *Fluoroscope* we investigated the conditions as they are in the living, but it is possible by means of the so-called *skiagraph* to take an x-ray photograph and permanently preserve the picture. Valuable as the x-rays are as a means of diagnosis, their importance is increased in medicine. Here a man well acquainted with the working of the machine may see a heart beat inside the body, may detect the beginning of changes in the lung which is the forerunner of consumption, may decide with certainty that a stone or calculus is located in the kidneys or bladder where its presence was only suspected. By the dentist the eruption of the teeth and the presence of retained roots or even extra teeth in the jaw may be discovered. For the obstetrician the position as well as the size of the child may be located in the mother. Medicinally the x-ray is being used largely. In certain varieties of cancer the growth is stopped, the inflammation is lessened, healing takes place and in favorable cases a perfect cure is obtained. This treatment holds true in too few cases to enable us to lose our dread of that disease and only where there are skin manifestations, and those not extensive, are they able to be held in check. When cancers are deep seated, as in the stomach or the liver, in which localities they are so liable to affect, we cannot expect much improvement. In a great variety of skin disease, as in eczema, neuralgia, pains, ulcers, keloid and lupus, the result from the Roentgen ray is extremely gratifying. As severe burns are liable to result where the rays are brought in contact with normal, that is, healthy skin, some means of prevention is to be used. Lead foil is placed on the body with a hole cut in it the size of the disease which is to be treated; the current is then turned on and the radiations from the tube are stopped by the non-conducting metal foil and only go through the opening under which the disease is present. An interrupted electric current is the means used to obtain the spark which jumps across the glass tube before described, and this break in the wire varies from eight to fourteen inches, according to the desire of the operator. The machine is made so that there will be about twenty-five thousand interruptions a minute.

Radium.

A CERTAIN substance, has been discovered to which the name of radium has been given, which has the power after an exposure to light of transmitting rays in every direction. By further investigation certain salts were separated from uranium and the impurities from these salts found to have greater power of transmitting rays. They have the same general properties that were found in the Roentgen rays, but a latent power is the cause of the phenomenon rather than electricity, as in the x-rays. Since 1901, Professor Currie with his wife, have added greatly to the knowledge concerning this body. In appearance radium is a crystal not unlike common salt and glows feebly in the dark. It has been impossible to obtain radium in any large amount, in fact, it requires eight tons of the residue from the radium ore to yield fifteen grains of pure radium. This would bring the price up to about \$125 a grain, which is three thousand times the price of gold. The rays that emanate from radium have the power of imparting their glow to all articles they are in the vicinity of. The hand, clothes and instruments of an experimenter with radium absorb the power of glowing in the dark. Although the scarcity of radium was mentioned, it is remarkable with all the investigators attempting to obtain it that there is so little still on the market. One year ago it was estimated that in the whole of Europe, including Germany and France, not more than forty grains of pure radium salt exists. The power of continually emitting the feeble light which it was formerly supposed did not cause any lessening of the substance itself, is now known to diminish its weight, so while the loss is almost infinitesimal, in fact, not able to be measured, yet there is some loss going on from the discharge of the rays. The same property of liability of burns is always noticed in radium. Carrying a minute quantity in a glass vial in the pocket has caused a fortnight later a deep and painful sore on the body which required weeks to heal. The same precaution, *i. e.*, lead foil that was recommended for the x-rays is necessary for radium rays. The sensation of light is perceived through the closed eyelid, which is not due to the eye seeing the light but due to the phosphorescence set up by the rays, passed through the liquid and through portions of the eye. The rays that are absorbed by materials other than radium itself lose their property after a greater or less period of time, depending partly on the kind of substances and partly on the action of the air. If lead has been exposed to the action of radium and then sealed up, it loses its power of discharging rays very much slower than lead which has been freely exposed to the air. Radium does not lose its power on exposure to the greatest degrees of glow; on the other hand, intense heat causes sudden discharge of rays with corresponding loss of light, which, however, is renewed within two or three days if allowed to rest. The same class of medical cases that the rays have been used

for have been the subject of experiment by radium. In cancer and other diseases which have their origin in the growth of germs it has been hoped that the influence of radium rays would modify their course, and it is true that many patients have had no relapse for some months after treatment; whether a permanent cure can be announced it is yet too early to say. The mode of treatment by radium consists in enclosing a small portion of radium between two metallic sheets, one of copper, the other of aluminum with the aluminum face downward upon that portion of the body which is to be treated, and an exposure of fifteen minutes a day is allowed for a period extending over weeks or months. Although radium is present in such minute quantities, it is nevertheless widely distributed in America. It is found in a mineral known as carnotite which is abundant in Utah. In Texas a quantity of earth always gives up a small amount of radium. Abroad, in certain of the mountains, especially in the region of Saxony, radium has been extracted from the by-products of the silver ores. Two other substances, namely polonium and actinium, were discovered at about the same time with radium. Their difference from the others is comparatively nothing, except greater or less brilliancy and the color of their rays.

Trachoma.

TRACHOMA or granulated lids, is a contagious disease of the eyelids characterized by swollen lids and reddened conjunctiva or lining of the lids, which, when they have existed some time, result in discharges which can infect the other eye or the eyes of other persons by means of towels, hands, etc. Small sago-grain bodies appear on the inner portion of the lids. These multiply, the lids become thickened and then changes occur, leaving scars which distort the lids and impair the vision. The disease is one of long duration, though recovery is fairly common if proper treatment is persisted in.

Treatment.—It is absolutely necessary that an eye doctor should be put in charge of the case owing to the danger to the sight and the contagiousness of the disease, yet a mild lotion of a two per cent solution of boracic acid may be used several times daily in the acute stages, but the eye is very delicate and great care must be taken in its treatment.

Arteries.—Hardening of (Arterio-Sclerosis).

THERE is no real cure for this disease, but Professor Adolf von Strumfer of Vienna and other prominent physicians state that this disease may be avoided, and may be lessened in its advance, by refraining from over-physical strain, also from indulgence in rich foods, such as pastry, dark meat, rich sauces and gravies, from alcohol and tobacco, more especially the latter.

Flatfoot.

AN affection of one or both feet that is very often mistaken for rheumatism and treated with rheumatic remedies for a long time without relief, is flatfoot or broken arch. To obtain the strength necessary to enable the weight of the body to be carried in a light, graceful and easy manner, the foot is not placed entirely on the ground, but an arc or arch is formed by the bones being held in a certain position by the ligaments. Rapid growth of fat with gain of weight, long standing on hard pavements, and much walking cause these ligaments to lose their efficiency and the arch gives away and flatfoot results, as in Figure 1.

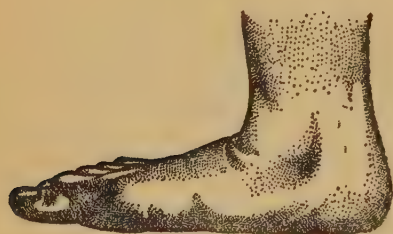


FIG. 1.



FIG. 2.

The presence of flatfoot may be determined by wetting the sole of the foot and placing it on a dry planed board. The imprint will show the entire surface of the bottom of the foot, while if there is no flatfoot, the imprint will show only the toes, ball and heel of the foot, and the outer edge, the whole having the effect of a crescent, the arch as in Figure 2 not touching the board.

Symptoms.—The symptoms of flatfoot are pain and tiredness anywhere from the ankle to the hip. Great discomfort is felt if standing is continued over a great period of time. Possibly the pain is most severe in the calf and the big ligament at the back of the ankle. Symptoms are less pronounced in the morning, and in fact in early cases all of the pain will be felt on going to bed, and excepting for a sense of stiffness, the troubles will have disappeared until the causes are again at work.

Treatment.—The simplest method of repairing a broken arch is by the use of pads made of some non-absorbable material and with density enough to give support. Many times if the arch is properly supported it will regain its tone and the pad may be dispensed with. Metal plates are much better and are for sale at any first class shoe store.

Riggs' Disease or Pyorrhea Dentalis.

Usually begins in early adult life.

Cause.—It is caused by a specific germ (*Endameba buccalis*) which destroys the membrane surrounding the tooth.

Symptoms and Course.—The germ (*Endameba*) cannot attack healthy tissue. The infection usually begins around the back teeth. Any wounding of the gums by toothpicks, hard particles of food, long continued pressure between the teeth are favorable conditions.



(THE TEETH IN THIS CUT ARE ENLARGED TO GIVE A BETTER ILLUSTRATION OF THE DISEASE.

A dissection of the gums around the lower front teeth.

1 and 2. Teeth in normal, healthy gums. (a) The point where pyorrhea or Riggs' Disease ordinarily first shows.

3. Gum and outer plate of the bone cut away—showing healthy condition of the gum and tissues surrounding the tooth. (a) root of tooth, (b) gum, (c) peridental membrane, (d) alveolar process—the bony socket of tooth—(note its cellular structure).

4. Tooth attacked by pyorrhea—elongated, gums receded. (a) destruction of the alveolar process and peridental membrane—the pus pockets, (b) filled with pus and micro-organisms.

5. Tooth attacked by pyorrhea, not so far advanced as Fig. 4. (a) Inflamed and receding gums, tooth sensitive to heat, cold and touch, owing to uncovering of the dentine.

At first the gums may appear only swollen and reddened, or to extend up between the teeth. The gums bleed easily when picked or brushed. In time a loosening of the gums from the tooth will occur forming a pocket, which gets larger and deeper until the whole root is bared. This pocket forms a suitable place for the decomposition of food and the formation of foul-smelling pus which collects around the teeth. The tooth then falls out.

Cure.—These germs (*Endamebas*) can be destroyed by taking two tablets of 1 grain each of powdered Ipecac three times daily for from four to six consecutive days. The treatment should be repeated from time to time until all trace of the disease is gone, which may be several weeks or months. Rinse the mouth at night with one drop of the fluid extract of Ipecac in a wineglass of water. Proper dental treatment should also be invoked, consisting of cleaning and scaling the roots, removing dead and bare bone and cleaning out the available diseased pockets.

BANDAGES.

FOR the purpose of holding dressings of all kinds in place, to obtain compression, to give support, or correct deformities, and finally, to immobilize splints, we use layers of cheese cloth, cotton flannel, rubber or other material which we call bandages.

To further increase their usefulness we either apply certain substances after the bandage has been put on or we may apply the same substances in the bandage material and hardening will occur in the meshes of the bandage. These materials are plaster of paris, starch, glucose or silicate of sodium.

The Hand.—The ordinary handkerchief bandage is often used to temporarily hold dressings in place when the roller bandage is not available. By folding a linen or silk handkerchief on a line from one corner to the opposite diagonal and then folding twice more we obtain with a large handkerchief a bandage that will be from



Figure 1.

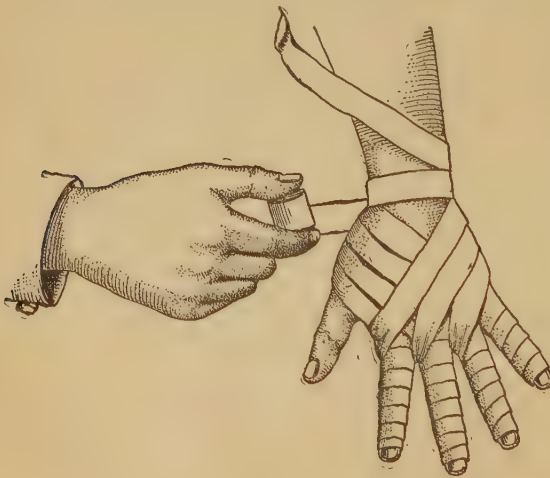


Figure 2.

four to five inches wide. Place the hand, palm downward, in the middle of the bandage, carry the ends over and cross them on the back of the hand, then around the wrist and tie in a square knot (see Fig. 1).

For finger and hand bandaging take a roller bandage varying in width from one inch to three inches

wide and five yards long. After the dressing has been applied take two or three turns around the finger to hold the bandage from slipping, then from left to right making the distances neat and even, carry the roll around the finger.

The figure of eight, which has the advantage of giving better compression is made by carrying the bandage away from the person applying it on the upper stroke, then around the hand and toward the person on the down stroke, making the crossing point in the middle of finger, as illustrated, and having each crossing point one-half inch higher up than the one preceding (see Figures 2 and 3).

Wrist and Forearm.—A two or three inch width bandage is needed. Begin with a couple of turns around the wrist, then down over the back of the hand to make a beginning at about the junction of the fingers with the flat of the hand. Use the figure eight up to the beginning of the wrist,

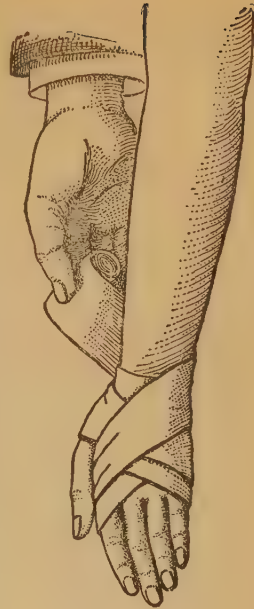


Figure 3.

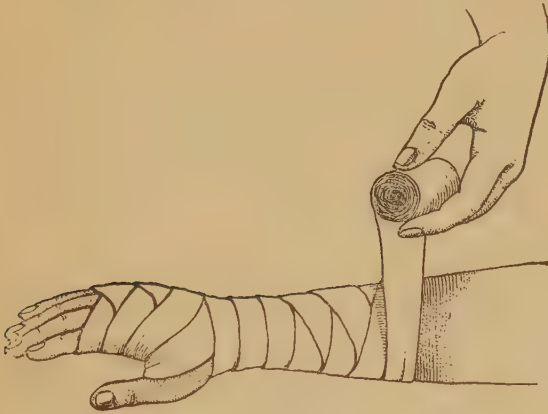


Figure 4.



Figure 5.

then three or four circular turns, then the figure of eight again up to the elbow and if necessary to bandage the elbow, carry the roll directly over the point of the elbow, then the next turn just above and the following one just below. Continue until the elbow is covered in and then begin the figure eight style above the elbow



Figure 6.

(see Figures 4, 5 and 6).

Leg.—For the leg at any point, begin with the circular for two or three turns and continue with the figure of eight.

Head.—Use two bandages, carrying the first one several times around the head just above the ears, and then catching the other



Figure 7.



Figure 8.



Figure 8A.



Figure 9.



Figure 10.



Figure 11.



Figure 12. The jaw.



Figure 13. The eye.



Figure 14. The heel.

Figure 15. The foot.

Figure 16. The foot.

bandage each time, which is being carried over the top of the head at right angles to the first (see Figures 8 and 8a).

Figures 9, 10 and 11 explain themselves in illustrating the use of one or two handkerchiefs when used for bandages.

Jaw.—The jaw should be bandaged in the manner shown in Figure 12. It is well to catch the crossing points of the bandage on either side with a safety pin or with needle and thread.



Figure 17. The calf.

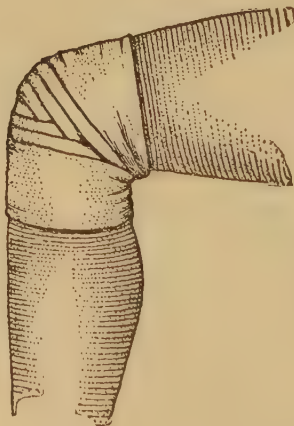


Figure 18. The knee.



Figure 19. The thigh.

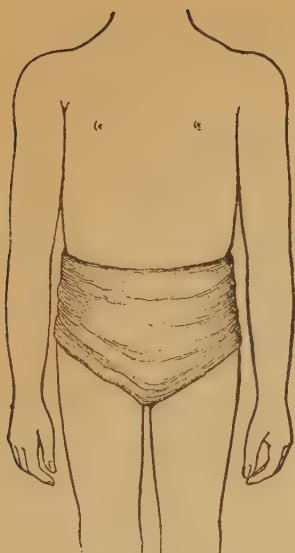


Figure 20. Abdomen.

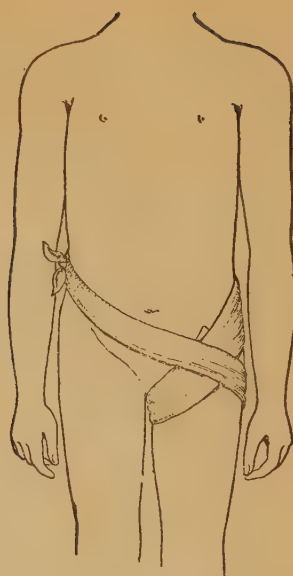


Figure 21. Groin.

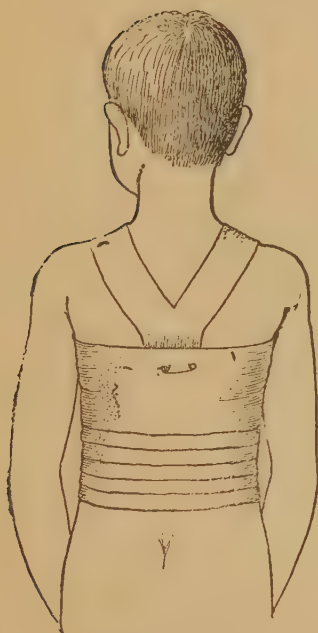


Figure 22. Back.



Figure 23. Chest.

Eyes.—A handkerchief or roller bandage will act equally well for bandaging the eye (see Figure 13).

Foot, Calf, Knee and Thigh.—The bandaging of the foot and leg is done precisely the same as the hand and arm. The knee is treated similarly to the elbow. The bandages of the thigh, called the "spica," is simply a pattern of the figure of eight with the loop enclosing the abdomen greatly enlarged (see Figures 14, 15, 16, 17, 18 and 19).

Abdomen, Groin, Chest, Back, and Shoulder.—The abdomen may be sustained by a handkerchief, or better, with a "swathe" about ten to twelve inches wide and pinned securely in front with safety pins (see Figure 20).

The chest and back may be swathed or bandaged with the circular turns and a short piece of bandage passed over the shoulder (suspender style) to prevent it from slipping, and pinned with safety pins as in Figures 22 and 23.

The shoulder is bandaged in a like manner as the thigh and groin (see Figure 24).

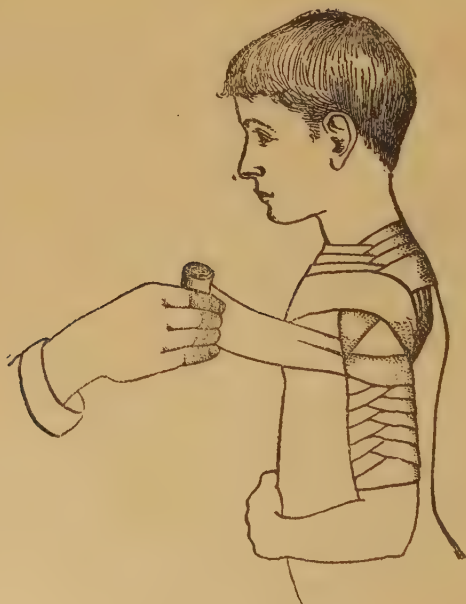


Figure 24. Shoulder.

